



---

## Table of Contents

<b>Section</b>	<b>Page</b>
1. Company Safety & Health Policies .....	4
2. Accident Reporting General Information .....	9
3. Medical Records Access and Retention .....	13
4. Control of Hazardous Energy.....	18
5. Pre-job Planning.....	26
6. Marine Crane Policy Guidelines for Floating Cranes .....	33
7. Asphalt Operations .....	36
8. Confined Space Entry .....	40
9. Excavation and Trenching.....	48
10. Demolition.....	57
11. Health and Environment .....	63
12. Hazard Communication .....	66
13. Respiratory Protection Program.....	76
14. Lead In Construction .....	90
15. First Aid and Bloodborne Pathogens .....	111
16. Hearing Conservation .....	120
17. Crystalline Silica.....	124
18. Personal Protective Equipment .....	130
19. Fire Protection, Prevention, and Emergency Action.....	139
20. Signs and Signals .....	144
21. Material Handling .....	147
22. Tools: Hand and Power .....	150
23. Welding and Cutting .....	163



---

<b>24. Electrical .....</b>	<b>173</b>
<b>25. Scaffolding and Aerial Lifts .....</b>	<b>176</b>
<b>26. Stairways and Ladders .....</b>	<b>178</b>
<b>27. Crane Hoisting Operation and Maintenance.....</b>	<b>184</b>
<b>28. Motor Vehicle and Mechanized Equipment.....</b>	<b>204</b>
<b>29. Concrete, Forms, and Shoring.....</b>	<b>213</b>
<b>30. Steel Erection .....</b>	<b>221</b>
<b>31. Sling Safety.....</b>	<b>222</b>
<b>32. Fall Protection Safe Practice.....</b>	<b>231</b>
<b>33. Drug and Alcohol Testing Policy .....</b>	<b>241</b>
<b>34. Working Near or Over Water .....</b>	<b>251</b>
<b>35. Temporary Traffic Control Procedures .....</b>	<b>256</b>



---

## Table of Appendices

<b>Appendix</b>	<b>Page</b>
<b>Appendix A: Authorization for the Release of Medical Record Information .....</b>	<b>17</b>
<b>Appendix A: Bloodborne Pathogens Exposure Control.....</b>	<b>116</b>
<b>Appendix A: Definitions Applicable to Safety Policies, Procedures, and Practices.....</b>	<b>258</b>
<b>Appendix B: Guidelines for Supervisors .....</b>	<b>263</b>
<b>Appendix C: Crane Operator Guidelines.....</b>	<b>267</b>
<b>Appendix D: Crane Operator Proficiency Assurance Examination .....</b>	<b>272</b>
<b>Appendix E: Crane Inspection Program.....</b>	<b>275</b>
<b>Appendix F: Essential Field Forms .....</b>	<b>283</b>
<b>Appendix G: CLP Safety Forms (SF) .....</b>	<b>284</b>
<b>Appendix H: Cranes and Derricks in Construction 29 CFR 1926 Subpart CC.....</b>	<b>297</b>



---

## 1. Company Safety & Health Policies

### Purpose and Scope of the Safety & Health Manual

Austin Bridge & Road is committed to providing a safe and healthful workplace for the Employee-owner. Our safety & health manual is intended to be a basic communication and reference tool. It cannot address every imaginable related topic, nor does it take the place of applicable regulatory standards such as OSHA. Utilize your company safety representatives as a resource to help you in the application of safety practices and/or to interpret regulatory standards.

Employee-owners who fail to abide by these rules will be subject to disciplinary actions, including termination.

### General Safety & Health Initiatives

1. The use of unsafe machinery, tools, materials or equipment is prohibited. Unsafe tools, materials or equipment must be removed from service and identified as unsafe by tagging or by locking the controls to render the tools inoperable to prevent someone from mistakenly trying to operate and/or use such materials.
2. Only personnel certified with documented training and experience will operate equipment and machinery.
3. Supervisors must instruct employee-owners in the recognition and avoidance of unsafe conditions and safety regulations applicable to the areas where they work to control and eliminate any hazards that might result in injury or illness.
4. Supervisors must instruct employee-owners to report any unsafe acts and conditions immediately. By doing so, we increase safety awareness and improve hazard identification which allows for corrective actions and a safer construction project. Unsafe conditions must be corrected prior to commencing work. Work that cannot be done safely in accordance with company policy shall not be performed.
5. Hazards must be identified, and controls implemented for each task prior to starting work.
6. Safety meeting attendance is mandatory.



7. When employee-owners are not sure how to perform their assigned task safely, they must immediately stop work and contact their supervisor.
8. Supervisors are responsible for requiring the use of appropriate and required personal protective equipment in operations where exposure to a hazardous condition exists and where such equipment is deemed essential to reduce hazards (such as personal protective equipment requirements outlined in this manual and/or stipulated by the responsible superintendent or foreman).
9. The foreman and/or other designated project supervisor will make frequent and regular inspections of job site materials and equipment. These inspections may be augmented by other inspections conducted by company safety representatives.
10. The possession or consumption of alcoholic beverages, narcotics or mind-altering drugs is not permitted on any project site or on company premises:
  - Employee-owners may not drive or operate a company motor vehicle or equipment while under the influence of alcohol, narcotics or mind-altering drug.
  - Employee-owners must report the use of any medication that could cause physical or mental impairment or diminished concentration at work, to their supervisor, immediately.
11. Form materials, scrap and debris must be cleared from work areas and structures. Protruding nails must be removed from the lumber scrap materials to prevent puncture wounds.
12. Combustible scrap and debris must be removed and disposed of properly at regular intervals.
13. Employee-owners can demonstrate pride in their work as evidenced by good housekeeping, clean work areas, and neatly organized construction sites.

### **Regulatory Inspections**

Workplace inspections may be made by one or more of the governmental agencies listed below:



- 
1. Occupational Safety & Health Administration (OSHA)
  2. Mine Safety and Health Administration (MSHA)
  3. US Coast Guard
  4. State health & safety agencies such as the workers' compensation commissions
  5. State and federal environmental agencies

When a representative of any of the above-listed agencies appears at the project site, supervisors should follow the guidelines set out below as closely as possible.

Non-supervisory personnel should contact their supervisors immediately.

Supervisors should follow the procedures outlined below:

1. Greet the compliance officer cordially
2. The compliance officer should, at this time, present identification and tell you the nature of his or her business
3. The compliance officer will advise you of the reason for the inspection:
  - a. Scheduled inspection
  - b. Complaint
  - c. Accident investigation
  - d. Referral
  - e. A follow-up inspection to verify abatement if the project has been previously inspected
4. Immediately after identification and statement of purpose of the visit by the compliance officer, ask the officer to wait while you contact the company Safety Director.
5. Austin's project manager/superintendent and/or safety representatives will advise affected parties as to the purpose of the visit and request appropriate participation necessary to complete the inspection process. It is expected that the project manager/superintendent will accompany the safety representative and OSHA compliance officer on the inspection.



- 
6. If any site personnel are represented by a labor organization, they must be given the opportunity to have a union representative accompany the compliance officer on the inspection. If an employee representative does not go on the inspection, his or her employer will pay the employee representative for this time.

**NOTE:** It is required that the Company Safety Director be contacted (immediately) whenever a job site is visited or contacted by any enforcement agency.

### **Employee-Training**

- Crew-level safety meetings should be held each morning as a part of the Job Hazard Analysis (JHA) to discuss the day's activities. These meetings should be brief (5 to 15 minutes) with affected employee-owners in attendance. The meeting should be led by the foreman and cover possible hazards of the work to be performed.
- The foreman or superintendent will conduct Weekly Toolbox Safety meetings and require employee-owner and sub-contractors to attend. Once the safety subject is presented, a short discussion with employee-owner/sub-contractors should be held allowing for questions and to receive answers. Signatures and the attendees at the weekly safety meeting and the safety-related subject matter covered must be documented in HCSS and with the Safety Department for future planning and company inspection.

### **Supervisor Safety Meetings**

Safety meetings will be conducted twice per year at the Biannual Safety Trainings, supervisors are required to participate. Safety and health need not be the only topics covered, but these topics must be a substantial portion of the meeting (at least 50 percent). ABR safety representatives and field personnel are responsible for the content of these biannual annual meetings. Attendees must sign in electronically and the meeting roster will be submitted and tracked through HCSS.

### **Important Management/Supervisory Support Activities**

- Assist and participate in safety/health-related activities such as safety inspections, training, accident investigation, and similar functions to bring



---

experience and job knowledge to the process to improve the outcome of construction

- Demonstrate your buy-in with your attitude and personal example.
- View safety and health practices as part of the construction process and not as a separate function.
- Take every opportunity to recognize and re-enforce safe performance.

### **Life Critical Rules**

To enhance our safety performance and focus, we have identified the Life Critical Rules. These rules are specifically focused on reducing the risks of serious incidents for workers performing critical activities. The rules provide an added measure of protection and strengthen our existing Safety and Health System.

Any Austin Employee-Owner found to violate any of these rules will be subject to disciplinary action and possible termination. Additionally, a subcontractor employee or supervisor found to be knowingly violating any of these rules will be removed from the site and barred from all future Austin projects.

Life Critical Rules Include:

1. Violation of Austin Bridge & Road fall protection safe practices (section 35)
2. Operating a crane without functioning safety devices
3. Failure to follow Lockout/Tagout procedures
4. Failure to obtain proper authorization before entering a confined space
5. Failure to develop a lift plan for a critical lift
6. Entry into a trench/excavation 5 foot or greater depth without proper trench protection
7. Failure to maintain minimum clearance from overhead power lines
8. Working outside of the traffic control plan





---

## 2. Accident Reporting General Information

### General Requirements

1. Employee-owners must immediately report an injury, accident, and/or serious incident to their supervisor.
2. An accident is an event that injures someone, causes damage to property or materials, and/or negatively affects production.
3. An incident or near-miss is an event, which under slightly different circumstances would have led to injuries, damage to property or materials, and/or negatively impacts production.
4. The difference between an accident and an incident is the outcome; both occurrences involve an undesired event.
5. It is important to notify an ABR supervisor and safety representatives of both accidents and incidents so that an investigation can be conducted in an attempt to identify contributing factors. This will allow controls to be implemented to prevent similar occurrences in the future.
6. Accident reporting is **required** for the following events:
  - Auto accidents (ABR-owned vehicles or vehicles operated for ABR business)
  - Property damage cases
  - Accidents involving subcontractors' employees, vendors, suppliers, visitors, client representatives, and all other project stakeholders.
  - Employee-Owner injuries
  - Incidents that have the potential for future injury, litigation or loss
  - Traveling public within our construction zone
7. A **0-60 Incident report** must be completed by the supervisor in charge and submitted within 60 minutes of the occurrence using HCSS Forms. This initial report should only include known facts and not the opinions of the recorder.



- 
8. Depending on the location of the occurrence, additional reporting forms may vary (owner-controlled projects, different insurance companies have their format, etc.). Accidents will be reported on the appropriate form within the stipulated reporting time frame. Any questions regarding reporting forms, time, and reporting should be directed to a company safety representative.
  9. Employee-owners will immediately report accidents, incidents, and near-misses to their supervisor. The supervisor receiving the report will follow the notification reporting system as appropriate.
  10. A safety representative or designee will accompany any injured employee-owner (s) to the clinic or emergency room on the initial visit.
  11. Employee-owners suffering a serious or life-threatening injury will be transported to emergency treatment facilities by ambulance. ABR safety representative or designee will meet the employee-owner at the emergency facility.

### **Emergency Notification**

1. An emergency is anything that can endanger someone's life, fall under scrutiny by the government or media, significantly interfere with normal business operations, jeopardize ABR's positive image, or threaten the company's legal or financial condition.
2. If the project manager or superintendent is not on-site when the emergency occurs, ask whomever you reach on the following list to assist with notifying the project manager or superintendent.
3. The senior on-site supervisor is responsible for assuring that one person on the following list is notified immediately. He/she does not have to make the call, but whoever does should be familiar with the nature of the emergency.



Austin Bridge & Road
Vice President of Operations
Area Manager
Project Manager
Safety Director
Safety Representative

4. Spread the word. The person you reach on the above list is responsible for notifying the other employee-owners on the list plus appropriate home office personnel.

### Investigations

1. Project and operational leadership will investigate accidents. The investigation will be documented appropriately in HCSS. The safety department will assist in determining cause analysis.
2. A company safety representative will assist with the investigation of fatality accidents and OSHA accident investigations.
3. Fatality and serious injury accident investigations will only be carried out at the direction of, and under the supervision of, the Corporate Counsel and/or designated representative(s).
4. OSHA requires that we report fatality accidents within 8 hours of the occurrence. Any hospitalization other than for diagnostic testing or observation will be reported by the Safety Director and/or designated representatives within 24 hours of occurrence. Any such event must be immediately reported to the personnel listed above.
5. Investigations will focus on the: who, what, when, where, and how. These are important factors to consider so that issues can be fully developed, opportunities identified for control application, and future events prevented.



- 
6. Serious accidents will be investigated (unless otherwise directed by the Safety Director). A company safety representative can assist supervision in applying the root cause analysis principles.

### **Records**

1. A copy of accident and incident reports will be retained in HCSS.
2. Entries will be made (as appropriate) on the OSHA Log by the Safety Department's authorized employee-owner responsible for regulatory recordkeeping.
3. Injury records will be handled as containing confidential information and access limited to the safety department, insurance company, and legal representatives.
4. Accident records will be filed when not in use.

### **Training**

At least one (1) supervisor's safety- training meeting and one (1) employee-owner toolbox safety meeting will be conducted annually to review the information contained in this procedure.



---

### **3. Medical Records Access and Retention**

#### **Policy**

It is the policy of Austin Bridge & Road that meaningful and accurate occupational medical and exposure records shall be maintained for employee-owners and that the records are available to employee-owners upon an appropriate request.

#### **Responsibilities**

##### ***Safety Director***

The company Safety Director or designee will ensure compliance with this procedure.

##### ***Employee-Owner***

Each employee-owner may request only his/her medical records unless that employee-owner chooses to designate a representative (in writing) to procure records for him/her. All requests for employee medical and exposure records shall be forwarded to the Safety Director or his designee.

#### **General Requirements**

This procedure applies to medical records required by OSHA standards and/or Company policy.

The company Safety Director and/or his designee will ensure regulatory compliance and the availability of employee-owner medical records.

#### **Preservation of Records**

Unless a specific OSHA standard provides for a different period, we are required to ensure the preservation and retention of records as follows:

1. Employee-owner's medical records:
  - The medical records of employee-owners who have worked for less than one year need not be retained beyond the length of employment.
2. Employee-owner exposure records:
  - Each exposure record will be preserved and maintained for at least 30 years.



- 
- Background data to environmental (workplace) monitoring or measuring, such as lab reports and worksheets, need only be retained for one year so long as the sampling results, sampling plan, a description of the analytical methods used, a summary of other background data relevant to the interpretation of the results obtained and retained for at least 30 years.
  - Safety Data Sheets and records concerning the identification of a substance or agent need not be retained for any specific period as long as some record of the identity (chemical name) of the substance or agent, where it was used and when it was used is retained for at least 30 years.
  - Biological monitoring results designated as exposure records (such as lead blood levels), by OSHA standards will be preserved and maintained as required by the standard.
  - Analysis using exposure or medical records: Each analysis will be preserved and maintained for at least 30 years.

### **Access to Records**

1. Whenever an employee-owner of a designated representative requests access to medical records, we will ensure that the records are provided within a reasonable time, place, and manner. If we cannot accommodate the request within 15 working days, we must notify the employee-owner and make them aware of the reason for the delay and the earliest date when the records can be made available.
2. We can require the employee-owner to provide us with information necessary to retrieve the medical records such as dates, times, and locations worked.
3. Whenever the employee-owner or representative requests a copy of their medical record, we must ensure that either:
  - A copy is provided without cost
  - The necessary mechanical copying facilities are made available without cost



- 
- The record is loaned to the employee-owner or representative for a reasonable time to enable a copy to be made
    - i) In the case of an x-ray, we can restrict access to onsite examination or make other suitable arrangements for the temporary loan of the x-ray
    - ii) Whenever a previous record has been provided, we can charge a reasonable administrative fee (non-discriminating such as copying expenses but not including overhead administrative expenses). These would not include situations where the requested additional information was new or added after the first request
- 4.** An employee-owner exposure record consists of:
- A record that measures or monitors the amount of a toxic or harmful substance or physical agent to which the employee-owner is or has been exposed
  - In the absence of such records, such records of other employee-owners with past or present job duties or working conditions related to or similar to those of the employee-owner to the extent necessary to reasonably indicate the amount and nature of the substance or harmful physical agents to which the employee-owner is or has been subjected
  - Exposure records to the extent necessary to reasonably indicate the amount and nature of a substance or physical agent to which the employee-owner is being assigned or transferred
- 5.** Request be designated representatives must be in writing and contain the specific written consent of the affected employee-owner. See Appendix A on page four (4) of this procedure for a request form.
- 6.** A physician representing the Company can recommend that the affected employee-owner or designated representative consult with a physician to review and discuss the records requested, accept a summary of material facts and



---

opinions in place of the records requested, or accept a release of the requested records only to a physician or other designated representative.

7. Whenever an employee-owner requests access to their medical records, a physician representing the Company believes that direct access to the information contained in the records regarding a specific diagnosis of a terminal illness or a psychiatric condition could be detrimental to the person's health, we can inform the employee-owner that access will only be provided to a designated representative having specific written consent and deny the request for direct access to this information only. When a designated representative presents written consent, even when it is known that the information will be presented to the employee-owner, we must provide the requested information.
8. A physician, nurse or other responsible health care personnel maintaining employee-owner medical records may delete from requested medical records the identity of a family member, personnel friend or fellow employee-owner who has provided confidential information concerning the affected employee-owner's health status.
9. Any analysis that uses exposure and/or medical records based on the working environments and/or conditions will be provided upon request.
10. Whenever access is requested to an analysis, which contains specific employee-owner information name, address, etc., and/or information that could be used to identify specific employee-owners, we must ensure that personal identifiers are removed before access is provided. If removal of personal identifiers is not feasible, access to that portion of the report containing personal identifiers need not be provided.





---

**Appendix A: Authorization for the Release of Medical Record Information**

I, \_\_\_\_\_ (full name of employee-owner), hereby authorize Austin Bridge & Road to release to \_\_\_\_\_ (individual or organization authorized to receive the medical information), the following medical information from my medical records, but I do not permit for any other use or re-disclosure of this information.

I give my permission for this medical information to be used for the following purposes:  
(Describe generally the information to be released)

Expiration Date of Authorization

\_\_\_\_\_  
Printed Full Name of employee-owner or Legal Representative

\_\_\_\_\_  
Signature of Employee-owner or Legal Representative

\_\_\_\_\_  
Date of Signature



---

## 4. Control of Hazardous Energy

### Policy

It is the policy of Austin Bridge & Road to have, as far as practical, all energy sources reduced to a zero-energy state and secured in the “OFF” or De-Energized position prior to permitting personnel to service or repair equipment that could accidentally start while work is being performed. When zero energy cannot be accomplished, alternative means of control must be implemented to achieve an equivalent level of protection.

This policy is intended to guide employee-owners as they control hazardous energy sources for all applicable serving and maintenance activities at all Austin Bridge & Road locations.

### Responsibilities

#### *Safety Director or Designee*

The Safety Director or his designated representative is responsible for ensuring that:

- Training programs are made available to the Project Managers/Superintendents for training of all site employee-owners
- Periodic inspections are performed to ensure compliance

#### *Project Manager/Superintendent*

The Project Manager/Superintendent is responsible for ensuring that the requirements of this procedure are met.

#### *Foreman*

Foremen are responsible for ensuring that:

- All affected employee-owners are notified of the Lockout/Tagout application to take place
- Employee-owners affected by this procedure are trained before being involved in Lockout/Tagout applications
- The requirements of this procedure are complied with before performing work on equipment



---

## ***Authorized Employee-Owners***

Authorized employee-owners are responsible for complying with the requirements of this procedure.

### **General Requirements**

This policy procedure covers the servicing and maintenance of machines and equipment in which the unexpected energization, start-up or release of stored energy could cause injury to employee-owners. These exposures exist at company plant sites and central equipment shops. However, electrical lockout/tagout is also required for construction site exposures. It is not considered adequate to simply lock and tag a system out of service. The system must be tested (try) to ensure there are no other feeds and that the proper breaker or fuse has been disconnected.

The protective measures outlined in this policy procedure are intended to be used anytime an employee-owner is required to remove or bypass a guard or other safety device. Also, if an employee-owner is required to place any part of the body into an area on a machine or equipment where work is performed (point of operation) or where an associated danger zone exists during a machine's operating cycle.

This policy procedure does not apply to cord and plug-connected electrical equipment for which exposure to the hazards of unexpected energization or startup of the equipment is controlled by unplugging the equipment from the energy source. The plug must remain under the exclusive control of the employee-owner performing the servicing or maintenance.

Necessary hardware such as locks, tags, blocks, wedges, etc. used for energy isolation will be provided to render equipment and machines safe for maintenance and repair work.

### **Application**

1. One type of standard tag will be used for lockout applications
2. Written procedures for locking out a particular machine must be developed unless:
  - The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down



- 
- The machine or equipment has a single energy source which can be readily identified and isolated
  - The isolation and locking out of the energy source will completely de-energize and de-activate the machine or equipment
  - The machine or equipment is isolated from that energy source and locked out during servicing or maintenance
  - A single lockout device will achieve a locked-out condition
  - The lockout device is under the exclusive control of the authorized employee-owner performing the servicing or maintenance
  - The servicing or maintenance does not create hazards for other employee-owners
  - No accidents have occurred involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance
3. Whenever tagout devices are used instead of lockout devices, a safety representative will be consulted to ensure and assist with the development of a site-specific plan to address standards outlined in this policy procedure applying to the uniqueness of the operation or project.

### **Lock and Tag Devices**

Lock and tag devices will be standardized (locks by color, shape, and size and tags by format and print size), individually identified, and not used for other purposes. These locks and tags will be the only devices used for lock and tag purposes and need to meet the following stipulations.

- Lockout and tagout devices will be capable of withstanding the environment for the exposure time expected. Wet, damp, and/or corrosive (storage of acids or alkali) locations should not cause deterioration or distortion of any tag message or notation.
- Lockout devices will be substantial enough to prevent removal without the use of excessive force or unusual techniques (such as cutting off with bolt cutters).



- 
- Tagout devices including their means of attachment will be substantial enough to prevent accidental removal. Attachment means will be non-reusable type, attached by hand, self-locking, and non-releasable (requiring at least an unlocking strength of no less than 50 lbs.). Nylon cable ties and recommended.
  - Lockout devices and tags will indicate the identity of the employee-owner, subcontractor, and company who applied the device.
  - Tagout devices will warn against hazardous conditions if the machine or equipment is energized and will include wording such as Do Not Start, Do Not Open, Do Not Close, Do Not Energize, or Do Not Operate.

### **Removal of Lock and Tag Devices**

Only the employee-owner who applied the device should perform device removal.

In the event the employee-owner who applied the device is not available to perform device removal, his Senior Manager (Project Manager, Safety Director) is the only one authorized to perform the removal.

### **Training**

- Affected employee-owners will be trained to ensure an understanding of the purpose, function, and skills required.
- Every authorized employee-owner will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the means and methods necessary for energy isolation and control.
- Each affected employee-owner will be instructed in the purpose and use of the energy control procedure.
- Other employee-owners who work in the area or who might be affected will receive instruction regarding the procedure and the prohibition relating to attempts to restart or re-energize machines or equipment, which are locked or tagged out.
- Retraining will be provided annually at a minimum for authorized and affected employee-owners.



- 
- Employee-owner training will be tracked to ensure that the training has been accomplished and is kept up to date. The training roster will contain the employee-owner name, topics covered, and date(s) and will be maintained in the HCSS system.
  - When a tagout system is used, employee-owners will also be trained in the following limitations of tags.
    - Tags are essentially warning devices affixed to energy-isolating devices and do not provide physical restraint on those devices locked out of service.
    - When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it and is never to be bypassed, ignored, or otherwise defeated.
    - Tags must be legible and understandable by authorized and affected employee-owners or others who may be in the area.
    - Tags and attachments must be able to withstand environmental conditions encountered in the workplace.
    - Tags will be securely attached to energy-isolating devices so that they cannot be inadvertently or accidentally detached during use.

### **Lock, Tag, and Try Process**

1. Company-authorized employee-owners who are performing maintenance or servicing tasks will be the only employee-owner to perform lockout and/or tagout.
2. Affected employee-owners will be notified by the supervisor or authorized employee-owner of the application and removal of lockout or tagout devices. Notification will be made before the controls are applied and after they are removed from the machine or equipment.
3. Before an authorized or affected employee-owner turns off a machine or shuts down equipment, the authorized employee-owner will know the types and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.



- 
4. The machine or equipment will be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employee-owners.
  5. Energy sources to a machine or equipment will be identified and the machine or equipment will be isolated from energy sources before servicing, maintaining, or repairing.
  6. The lockout/tagout device will be affixed to each energy-isolating device by the authorized employee-owner.
  7. Lockout/tagout devices will be affixed in a manner that will hold the energy-isolating device in a safe or off position.
  8. Tagout devices will be affixed in a manner that will indicate that the operation or movement of the energy-isolating devices from the safe or off position is prohibited. Tagout devices will be placed at the same point at which a lock would have been attached.
  9. When a tag cannot be affixed directly to the energy-isolating device, the tag will be located as close as possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.
  10. Following the application of lockout or tagout devices to energy isolating devices, potentially hazardous stored or residual energy will be relieved, disconnected, restrained and/or otherwise rendered safe.
  11. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation will be continued until the servicing or maintenance is completed or until the possibility of such accumulation no longer exists.
  12. Prior to starting work on the machine or equipment that has been locked or tagged out, the authorized employee-owner will verify that isolation and de-energization of the machine or equipment has been accomplished.
  13. Before lockout and tagout devices are removed and energy is restored to the machine or equipment, procedures will be taken by the authorized employee-owner to ensure:



- 
14. Inspect the work area to ensure that nonessential items have been removed and to ensure that the machine or equipment components are operationally intact.
    - The work area will be checked to ensure that workers have been safely positioned or removed.
    - After lockout/tagout devices have been removed and before a machine or equipment is started, affected workers will be notified that the lockout or tagout device(s) have been removed.
  15. The employee-owner who applied the device will remove each lockout/tagout device from each energy-isolating device.
  16. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position, the following sequence of actions will be followed:
    - Clear the machine or equipment of tools and materials as stated before and remove nonessential personnel as stated before.
    - Remove the lockout or tagout device following the steps outlined in this policy procedure.
    - Energize and proceed with testing or positioning.
    - De-energize the system and re-apply energy control measures according to the policy procedure to continue servicing and/or maintenance.
  17. Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this policy procedure, they will inform each other of their respective lockout and tagout procedures. Employee-owners will comply with the restrictions and prohibitions of the outside contractor's energy control program.
  18. Site-specific procedures will be developed in consultation with an Austin Bridge & Road safety representative whenever shift change or change in authorized personnel is necessary. The site-specific procedure must document procedures to be followed to:





- 
- Ensure the continuity of the lockout/tagout protection.
  - Provisions for the orderly transfer of lockout or tagout device protection between off-going and oncoming personnel.
  - Ensure protection against hazards from unexpected energization or start-up of the machine or equipment or the release of stored energy.
- 19.** When servicing or repairing motorized mobile equipment, the following shall be done:
- The equipment operation/service manual should be consulted to determine how the equipment should be de-energized. Methods may include but are not limited to:
    - Removing the ignition key
    - Disconnecting the battery cables
    - Disconnecting hydraulic/pneumatic lines or hoses
    - Blocking and cribbing parts that could fall
  - If the equipment has an ignition key, it must be removed and in the possession of the service or repair person or placed in a lock box.
  - A signed and dated “Danger – Do Not Operate” tag must be affixed to the ignition switch. The steering wheel or operator controls by the person(s) serving or repairing the equipment. This tag(s) must remain in place as long as the equipment is being serviced or repaired.
  - If the battery cables are disconnected, signed and dated personal “Danger – Do Not Operate” tag(s) must be affixed to the battery cables and equipment controls.
  - If personnel must work under elevated or suspended equipment, the elevated equipment must be supported by jacks, blocking devices, or cribbing in addition to the lifting or hoisting devices. The jack stands and blocking devices must be of the correct materials of construction and be capable of supporting the weight of the equipment.



---

## 5. Pre-job Planning

### Policy

Austin Bridge & Road is committed to providing its employee-owners with a safe and healthy workplace. Safety is to be planned in our work activities. This procedure provides the framework for planning safety in each project.

### Responsibilities

#### *Project Manager*

Project Manager responsibilities:

- Scheduling a pre-job safety meeting with the Safety Department
- Ensuring that company and job-specific environmental health and safety policies and procedures are implemented on the project
- Conducting a Hazard Analysis and developing the associated Work Plan and Hazard Controls
- Ensuring completion of Safety Action Plan (SAP) for the project

#### *Safety Director*

The Company Safety Director or designee's responsibilities:

- Assisting the Project Team with completion of the Safety Action Plan for site-specific environmental, health, and safety procedures
- Auditing compliance with this procedure
- Providing the Project Team with safety-related forms, posters, safety meeting topics, and training materials

#### *Superintendents and Foremen*

Each foreman will cover the aspects of this procedure with each employee-owner prior to beginning any work at each worksite by:

- Implementing company and site-specific environmental, health, and safety policies and procedures on the project
- Ensuring that all tools and equipment mentioned are provided



- 
- Conducting pre-job planning for each job and covering any hazardous aspects with his/ her crew members

### **General**

1. Ensure that a copy of the Austin Bridge & Road Safety and Health Policy and Procedure Manual is available for supervisor and employee-owner's reference.
2. Post emergency phone numbers. Review emergency procedures and rally points.
3. Post information informing the employee-owners of their rights regarding medical records access.
4. Post-OSHA Job Safety and Health Protection poster, appropriate state workers' compensation poster, Equal Opportunity, Family Medical Leave Act, etc.
5. The Safety Manager will contact representatives from local medical treatment facilities and emergency response service providers and ensure specific directions and contact names for the medical facility are available to site supervisors.
6. Ensure that supervisors have up-to-date first aid and CPR training.
7. Obtain first aid kits, AED, and fire extinguishers.
8. Arrange for sanitary facilities to include portable toilets, food and beverage areas, and means for disposing of waste and trash material.
9. Determine the safe location for the office trailer (if appropriate), sewer facilities, and utility service.
10. Determine the safe location for the tool trailer (if appropriate).
11. Designate a parking location away from heavy equipment.

### **Specific Safety Planning Issues**

1. Analyze the project site to identify hazards that need to be addressed, hazards created by plants and animals, location and storage of hazardous material such as gasoline, job site access and egress, equipment location and maintenance, confined spaces, and identify safety equipment needs.



- 
2. Identify overhead power lines, obtain voltage information from the utility owner, and place overhead warning signs.
  3. Inspect office and tool trailers to ensure that stairs and landings meet safety standards.
  4. Designate assembly areas for employee-owners during emergencies.
  5. Establish GFCI protection for the electrical power supply to the construction site.
  6. Establish a schedule for jobsite inspection and safety training.
  7. Implement a process for conducting Job Hazard Analysis (JHA) to identify hazards associated with the construction means and methods as the job progresses.
  8. Each subcontractor will attend a Pre-Construction meeting identifying the potential risks of their work operations. All subcontractors and tiered subcontractors are required to attend and provide their competent/qualified person designations.




---

**Pre-Construction Meeting Format**

Name/location: \_\_\_\_\_

Contractor's Name: \_\_\_\_\_

Project Number: \_\_\_\_\_ Date: \_\_\_\_\_

Specification Sections: \_\_\_\_\_

Major Scope of Work: \_\_\_\_\_

**Attendees**

Name	Position	Company



---

## Safety Concerns

1. All subcontractor workers need to view ABR's safety orientation video. It is the subcontractor's responsibility to ensure this requirement is completed prior to arriving onsite. The following links provide access to the videos (you will need to enter your company's information):

<http://safetyenglish.austin-ind.com/>

<http://safetyspanish.austin-ind.com/>

2. Toolbox safety meetings will take place weekly at a minimum, turn the meeting minutes into the superintendent weekly. (Subs)
3. The AB&R superintendent will hold job-wide safety meetings weekly; attendance by all site personnel is mandatory.
4. JHA's must be completed daily with sign-in sheets, and available at AB&R's request.
5. All incidents on the project must be reported to the AB&R superintendent within one hour of occurrence. An incident is any unplanned event, which causes personal injury, property damage, environmental impact, or disruption of activities.
6. Subcontractors will attend Weekly Update safety meetings.
7. Provide one copy of subcontractor Haz-Com program and SDS sheet file for all chemicals that will be brought to the jobsite.
8. Housekeeping must be performed on a continuous basis, minimum daily.
9. The project superintendent will designate temporary facilities such as restrooms, lunch and break areas, and smoking areas where required.
10. No harassment allowed on project site.
11. Parking for the employees will be as designated by the project superintendent.
12. Updated locates are each employer's responsibility. 48 business hours is required prior to disturbing soil once a ticket is requested. Locate ticket must be



updated every two weeks. All marked utilities must be located by hand tool potholing or hydrovac equipment prior to disturbing soil.

- 13. Only company vehicles, or those covered by the company insurance, allowed in the work area.
- 14. Minimum attire includes long pants, work boots, minimum ankle height with substantial soles, sleeved shirt.
- 15. Required minimum PPE includes ANSI Z87.1 eye protection, work gloves, Class III Reflective Vest.
- 16. Provide a list of the following personnel:
  - a. Equipment operators (backhoe, forklift, etc.)
  - b. Onsite crane submittal requirements (annual inspection with deficiencies and correction page, operator certification card)
  - c. Competent person for excavation
  - d. Competent person for fall protection
  - e. Competent person for scaffolds
  - f. Personnel qualified to use special tool (powder-actuated)
- 17. Provide site-specific fall protection plan
- 18. Provide site-specific trench protection plan (including serial numbers/shoring/shielding)

**Execution**

- 1. Insurance Certificate on file      Yes    No    N/A
- 2. Contract Agreement – executed/on file    Yes    No    N/A

**Review of Contract Documents/Scope of Work**

- 1. Specifications reviewed    Yes    No    N/A
- 2. Contract drawings reviewed      Yes    No    N/A
- 3. Scheduling reviewed    Yes    No    N/A    Start Date; \_\_\_\_\_
- 4. Scope Reviewed    Yes    No    N/A



---

**Submittal Review**

1. Have all submittals been reviewed      Yes    No
  2. If not, what items remain?              Date Required: \_\_\_\_\_
- 
- 
- 

3. Any Substitutions    Yes    No
4. Have they been approved    Yes    No
5. Mock-ups required    Yes    No

**Environmental Concerns**

1. SWPPP – Storm Water Pollution Prevention Program
2. Refueling area / maintenance
3. Chemical Storage area
4. Solid Waste / Recycling
5. Vehicle / Equipment washout area
6. Hazardous Waste disposal
7. Spill prevention
8. Spill Containment procedures





---

## 6. Marine Crane Policy Guidelines for Floating Cranes

### Purpose

The purpose of this section is to supplement the Austin Bridge & Road Operation and Maintenance Policy and all other appendices to address special concerns of working land cranes on barges in a marine environment.

All provisions and guidelines of the Austin Bridge & Road Policy remain applicable unless specifically amended by this appendix.

### Operation

A Marine Crane Plan shall be developed, reviewed by the Engineering Department, and approved by the VP and Safety Director before using a land crane on a barge. Such a plan shall address the specific use of each pairing of cranes to barges and identify all limiting conditions that may be a part of that pairing. The lift system, comprising the crane mounted on the barge, shall be analyzed by a qualified person to determine barge list or trim under all permitted operating conditions do not exceed the lesser of 5 degrees or the maximum recommended by the crane manufacturer.

All crane barges and barge systems carrying cranes will be stable in each condition of loading and operation and at each combination of hook load and crane radius as supported by design calculations. These design calculations are to be supplied before equipping the crane barge or barge system with the crane or cranes.

A Marine Critical Lift Plan shall be required whenever a lift is over 75% of the crane's marine chart capacity under the anticipated load and barge condition. Marine Critical Lift Plans over 90% of marine charts shall be approved by a VP and Safety Director before implementation.

All cranes will be supported by adequate crane mats placed on the barge surface in such a manner as to equally distribute the weight of the crane onto the interior bearing structure of the crane barge or barge system. Mats shall be restrained from movement on the barge surface during use.

External or surface-mounted ballast materials will be secured such that no shifting of the ballast will take place during the operation of the crane on the barge. If water is used as



---

ballast, only fresh water will be used, and the water must fill the compartment so that the normal listing of the barge does not cause the center of gravity of the ballast to change. The use of any ballast material shall be approved by a Registered Professional Engineer.

A barge or pontoon-mounted land crane requires modified ratings due to increased loading from list and trim. This rating will be different for each size of pontoon or barge used; therefore, the load rating of the barge or pontoon-mounted land cranes shall not exceed that recommended by the manufacturer or qualified person for the particular barge under the expected environmental conditions.

All deck surfaces of the pontoon or barge shall be above the water and the entire bottom of the barge or pontoon (excluding the rake) shall be always submerged.

When pulling spud piles used to fix the barge into position on the water, only the main hoist line will be used with adequate parts of line for the anticipated load. The strength of the parted line of the hoist must exceed the yield strength of the point of attachment of the spud pile so that the connection to the spud pile fails before the hoist line. Do not use the whip line to pull spuds.

An alternative to pulling the spud piles with the crane would be to use deck winches as a spud hoist. A spud hoist system must be of sufficient capacity for the intended spud piles and must be reviewed by the Engineering Department before use.

Ramps for access of vehicles or personnel to or between barges shall be of adequate strength, provided with sideboards and handrails, well maintained, and properly secured

At least one Coast Guard-approved 30-inch life ring with not less than 90 feet of line attached. Employee-owners working on barges shall be protected with U.S. Coast Guard-approved work vests at all times.

At least one Coast Guard-approved 30-inch life ring with not less than 90 feet of line attached, *and at least one portable or permanent ladder, which will reach above the top of the deck to the surface of the water.* Employee-owners working on barges shall be protected with U.S. Coast Guard-approved work vests at all times.

The competent person shall consider all environmental conditions and their effect on a safe lifting operation.



---

For night operations, adequate lighting shall be approved by a Qualified Person and meet all Coast Guard and other applicable statutes or requirements.

Housekeeping on a barge is essential due to the limited available space on a barge with large operating equipment. Loose materials shall be kept to a minimum and away from the edges of the barge. Excess materials shall be removed from the barge regularly.



---

## 7. Asphalt Operations

### Policy

To protect the safety and well-being of our employee-owners, the following Safe Operating Practices for Hot Mix Asphalt (HMAC) Construction will be incorporated into our Hot Mix Asphalt Operations.

### Equipment Operations & Procedures

1. Paving Machine
  - a. Pre-operation checklist
    - i) Hydraulic and oil leaks must be corrected before starting the paver
  - b. Utilize a “Dump Man” to guide trucks to safely access the MTV or paver hopper
    - i) EO will not ride on material trucks
    - ii) EO will utilize verbal and/or hand signals to communicate with the truck driver
    - iii) EO will notify the supervisor of any truck (subcontracted or owned vehicles) without an operational backup alarm
  - c. Proper machine cleanup is required at the end of each shift (Per manufacturer procedure). Lockout/Tag-out procedure training must be completed for any personnel before being assigned to an affected machine cleaning or maintenance role.
  - d. Equipment Storage
    - i) Identify a safe and secure location for equipment to be stored between shifts
      - Implement project-specific limits, when applicable
    - ii) Appropriate delineation should be placed around stored equipment
2. Material Transfer Vehicle (MTV)
  - a. Pre-operation checklist



- 
- i) Hydraulic and oil leaks must be corrected before starting the paver
  - b. Utilize a “Dump Man” to guide trucks to safely access the MTV or paver hopper
    - i) EO will not ride on material trucks
    - ii) EO will utilize verbal and/or hand signals to communicate with the truck driver
    - iii) EO will notify the supervisor of any truck without an operational backup alarm
  - c. Proper machine cleanup is required at the end of each shift (Per manufacturer procedure) Lockout/Tag out procedure training must be completed for any personnel before being assigned to an affected role in machine cleaning or maintenance.
  - d. Snorkel maintenance should be completed following manufacturer's procedures.
  - e. Equipment Storage
    - i) Identify a safe and secure location for equipment to be stored between shifts.
      - Implement project-specific limits, when applicable
    - ii) Appropriate delineation should be placed around stored equipment
- 3. Distributor**
- a. Pre-operation checklist
    - Hydraulic and oil leaks must be corrected before use
  - b. Always keep ignition sources and open flames at least 50 feet away from the distributor truck.
  - c. Physically check surroundings to ensure the area is clear of obstructions/persons before lowering spray wings



- 
- d. Maintain adequate volume, proper heat, and circulation for the type of material being stored in the distributor.
    - o Utilize the manufacturer's recommendations for maintaining volume, heat, and circulation.
  - e. Utilize proper PPE including face shield, rubber gloves, and apron when connecting/disconnecting the distributor to the source tank for unloading/loading material. Stand away from the connection area during the loading/unloading process.
  - f. Utilize the operator's manual when switching between materials and/or flushing the tank.

### **Nighttime Operations**

Nighttime operations require additional measures to provide a safe work area.

#### **1. PPE**

- Gaiters (reflective lower leg covers) are required for nighttime highway operations
- Safety vests should be inspected and/or replaced frequently to maintain the highest possible reflectivity and visibility.

#### **2. Illumination**

- a. The paver will be illuminated by a 400W balloon light and additional 55W halogen lights, as needed for the specific work activity.
- b. The rollers will be illuminated with 2 – 55W lamps mounted in the front and rear of each machine. These lights should be directed onto the newly paved surface enabling a clear view of the area being compacted.
- c. All illumination sources should be positioned to minimize glare to the traveling public.
- d. Mobile light plants can be implemented to improve visibility, as needed.

### **Spill Procedure (Liquid Asphalt Products)**

3. Shut off equipment and eliminate other ignition sources.



4. Keep employee-owners and other personnel away.
5. Prevent material from entering water systems and waterways by installing absorbent logs, earthen berms, etc around the spill area.
6. Notify the appropriate company safety representative immediately!

### **Emergency Medical Response**

1. Contact local emergency service number, 911!
2. Contact the direct supervisor and project-specific supervisor(s)



## **8. Confined Space Entry**

### **Policy**

Before entering a confined space, the space and work to be performed must be evaluated, potential hazards identified, and safeguards implemented to assure the safety and well-being of all employee-owners involved.

### **Responsibilities**

#### ***Safety Director/Designee***

The Safety Director or designee is responsible for:

- Providing specifications for gas testing and associated Confined Space Entry (CSE) equipment required by this procedure.
- Developing training for Entry Supervisors, Entrants, and Attendants on the content of this procedure.
- Serving as a resource to site personnel on CSE hazards and controls.
- Auditing compliance with this procedure.

#### ***Project Manager and Superintendent***

Project Managers and Superintendents are responsible for implementing the requirements of this procedure on their projects.

#### ***Directing Supervisor***

Each Directing Supervisor (Foreman, Supervisor, etc.) is responsible for completing the requirements of this procedure on all confined space entries. As such, he/she serves as the Entry Supervisor.

#### ***Authorized Entrant***

Authorized entrants are responsible for complying with the requirements of this procedure.

### **Definitions**

Confined spaces include, but are not limited to; storage tanks, process vessels, silos, drums, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults,





---

tunnels, pipelines, and open-top spaces more than four feet in depth such as excavations, pits, tubs, vaults, and vessels:

1. Confined Spaces also include any space, which has all of the following:
  - Large enough for an employee-owner to enter to perform work
  - Limited access and egress
  - Not designed for continuous human occupancy
2. Permit Required Confined Space is a space that has all the elements of a confined space.
  - The presence or possible presence of a hazard which may cause serious injury or death
  - Contains or may contain a hazardous atmosphere
  - Contains or may contain an oxygen-deficient atmosphere
3. AB&R prohibits the entrance to a known Immediately Dangerous to Life and Health Environment.

### **General Considerations**

1. Manhole entry into a tied-in system whether new or existing will be considered a permit-required confined space.
2. Conditions making it unsafe to remove an entrance cover will be eliminated before the cover is removed.
3. When the entrance cover is removed, the opening will be promptly guarded by a railing, temporary cover or other barrier that prevents falls through the opening and protects workers from foreign objects entering the space.
4. Before anyone enters a confined space, the atmosphere will be tested with a properly calibrated direct-reading instrument for oxygen content, flammable gases/vapors, and potential toxic air contaminants, in that order. Employee-owners will be provided with the opportunity to observe the atmosphere testing. Employee-owners conducting these tests will be trained on instruments before testing. Testing results will be documented.



- 
5. Austin Bridge & Road personnel will not be allowed to enter confined spaces that contain Immediately Dangerous to Life and Health atmospheres or require complex rigging techniques and equipment without the approval of the President and the Safety Director. Such entries, if allowed, will only be permitted after a detailed hazard analysis and the associated safe work practices have been implemented. In such situations, a specialized contract rescue team will be onsite before personnel are allowed to enter the confined space.
  6. Before work begins at a worksite, each employer must ensure that a competent person identifies all confined spaces in which one or more of the employees it directs may work, and identify each space that is a permit space, through consideration and evaluation of the elements of that space, including testing where necessary.
  7. If the workplace contains one or more permit spaces, the employer who identifies or receives notice of a permit space must:
    - Inform exposed employees by posting danger signs or equally effective means, of the existence and location of the permit space, and the danger posed by each permit space.
    - A sign reading “DANGER-PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER” is a minimum warning sign.
    - Inform promptly by means other than posting, its employees’ representatives, and the controlling contractor of the existence of, location of, and the danger posed by the permit space.
    - Each employer that identifies or receives notice of a permit space and has not authorized employees it directs to work in that space must take effective measures to prevent their employees from entering the permit space.
    - Each employer that authorizes the employees that it directs to enter a permit space must have a written permit space program implemented at the site. The written program must be available before and during entry operations for inspection by employees and authorized representatives.



---

## Permit Space Entry Communication and Coordination

1. Before entry operations in permit spaces, the host employer must provide the following to the controlling contractor
  - Location of each known permit space
  - Hazards or potential hazards in each space, the reason it is classified as a permit space
  - Any precautions that the host employer or previous controlling contractor or entry employer implemented for the protection of employees within the permit space.
2. Prior to entry operations in permit spaces, the controlling contractor must:
  - Obtain the host employer's information about the permit space hazards and previous entry operations
  - Provide host employer information and any additional information the controlling contractor, or other entry employers have implemented for the protection of employees inside the permit space to the entry employer
3. Before entry operations each entry employer must:
  - Obtain all of the controlling contractor's information regarding permit space hazards and entry operations
  - Inform the controlling contractor of the permit space program the entry employer will follow, including hazards likely to be confronted or created in each permit space.
4. The controlling contractor and entry employer must coordinate anytime more than one entity enters the permit space at the same time, or anytime a permit space entry is performed at the same time another activity could foreseeably result in a hazard inside the space.
5. After entry operation requirements:



- 
- The controlling contractor must debrief each entity that entered the confined space regarding the permit space program that was followed and any hazards that were confronted or created in the permit space.
  - The controlling contractor must then apprise the host employer of the information that was exchanged.

## **Entry Procedures**

1. The following procedures must be followed before any confined space entry:
  - Supervisor or designate will develop a hazard analysis of the space and work to be performed
  - Evaluate the space for potential and existing hazards
  - Test the atmosphere in and around the space for toxic and flammable gases
  - Identify space as permit or non-permit based on evaluation and monitoring results
  - Identify and provide required personal protective equipment such as lifelines and harnesses and special equipment such as explosion-proof lights
  - Identify and verify the training of crew
    - i) Entrant
    - ii) Attendant
    - iii) Supervisor
  - Verify rescue procedures and rescue team availability
  - Identify and check out the required tools and equipment to be used in the entry
  - Establish communication method(s) to be used for that work assignment
2. For permit-required spaces the following must also be required
  - Fill out a permit as required retained within HCSS.



- 
- Permit is good for only one shift (each shift is required to fill out its permit)
  - Evaluate the potential need for rescue and arrange for on or off-site rescue personnel
  - Verify that means of summoning emergency personnel and equipment is available for attendant
  - Verify that requirements of the site confined space entry program are met
  - Close permit at completion of work
  - Retain closed permits for 1 year (contact safety representative to determine storage procedures)

**3.** During confined space entries the following must be required:

- The employee-owner must understand the testing procedure, results, and resultant actions of the testing activities for confined space entry or must immediately contact a company safety representative.
- Attendant must remain at entrance space during the entire time work is being performed
- Continuously monitor the atmosphere and conditions in and around the space
- Attendant must maintain a head count of and communication with entrant(s) at all times
- Comply with the requirements of the confined space program

**Training Requirements**

Annual refresher training is required for all affected employee-owners

Each employee-owner who will be working in confined spaces during the performance of their work will receive the following training:

- 1.** Entry personnel (Entrant)
  - Hazard recognition
    - i) Knowledge of what hazards may be encountered



- 
- ii) Recognition of signs and symptoms of exposure to a hazard
  - iii) Understand the consequences of exposure to a hazard
  - o Communications
    - iv) Understanding of what communication method will be used
    - v) Understanding of the importance of communications with attendant
    - vi) Understand when and how to initiate evacuation and how to communicate with others involved
  - o Personal protective equipment
    - vii) Understand the need for personal protective equipment
    - viii) Understand the use and care of personal protective equipment issued
    - ix) Understand the limitations of the personal protective equipment
  - o Barricades and signage
    - x) Know what conditions require special barricades or signs
    - xi) Know where and how to erect barricades and signs
  - o Work practices
    - xii) Knowledge of acceptable and unacceptable work practices
    - xiii) Knowledge of acceptable entrance conditions
    - xiv) Knowledge of evacuation procedures and conditions that warrant evacuation
- 2. Attendant (watch personal)**
- o Receive the same training as the entrant
  - o Atmosphere monitoring
    - i) Procedures for atmosphere testing
    - ii) Equipment operation and calibration requirements



- 
- Duties of attendant
    - iii) Communications with entrant, supervisor, and rescue team
    - iv) Control access into confined space. (authorized entrants only)
    - v) Evacuation conditions
    - vi) Evacuation procedures
    - vii) Non entry rescue procedures
    - viii) Emergency response procedures
  - 3. Supervisor (foreman or person in charge of entry will receive the necessary training to be considered a competent person).
    - Receive the same training as an entrant
    - Receive the same training as an attendant
    - Permit and non-permit conditions of confined spaces
    - Hazard control procedures
    - Lock and tag procedures for stored energy
    - Non-entry rescue

Confined space classification and Confined Space Permits (where required) will be completed in HCSS.



---

## 9. Excavation and Trenching

### Policy

Before entering a trench or excavation, the area and work to be performed must be evaluated, potential hazards identified, and safeguards implemented to assure the safety and well-being of the entrants.

### Responsibilities

#### *Safety Director*

The Safety Director or designee is responsible for:

- Developing, identifying, or approving training for Competent Persons and personnel who work in and around trenches and excavations on the content of this procedure
- Serving as a resource to site personnel on Trenching and Excavation hazards and controls
- Auditing compliance with this procedure

#### *Project Manager and Superintendent*

Project Managers and Superintendents are responsible for implementing the requirements of this procedure on their projects.

#### *Foremen*

Each foreman is responsible for completing the requirements of this procedure on all trenching and excavation operations.

#### *Employee-owners*

Employees-owners are responsible for complying with the requirements of this procedure.

#### *Competent Person*

The Trenching and Excavation Competent Person is responsible for:

- Inspecting the work area before personnel entering the excavation and determining the soil type through analysis and completing the Project Excavation Checklist





- 
- Inspecting the trench/excavation at the start of each shift to ensure it is safe for entry
  - Advising the job foremen in safe work practices and conditions

### **Definitions**

For this policy/procedure, an excavation is any man-made cut, cavity, trench, or depression in the earth's surface. Since the requirements for trenches are explicit and, in some cases, more restrictive than for general excavations, the definition of trench as used herein is; a narrow excavation made below the surface of the ground, where the depth is greater than the width, and the width does not exceed 15 feet.

### **General Requirements**

1. Excavations five feet or more in depth must be protected from cave-in by one of the following methods.
  - Sloping
  - Shoring
  - Benching
  - Use of a shield designed/approved by a qualified registered professional engineer.
2. Means of egress from Trench Excavation. A stairway, ladder, ramp, or other same means of egress shall be located in trench excavation that is 4 feet (1.22 m) or more in-depth so as to require no more than 25 feet (7.62m) of Lateral Travel for employee-owners.
3. A registered professional engineer must design excavations 20 feet or more in-depth.
4. Excavations where the contractor elects to use the sloping or benching of the banks to prevent cave-in must be:
  - Sloped as required by the OSHA standards for the class of soil encountered.
  - Benched in such a manner that each vertical rise is no greater than 2 feet

- 
- The equivalent slope of benching must match that required by the OSHA standards for the class soil encountered
- 5.** Shoring systems must meet the requirements of the OSHA standards for construction.
- Designed using tabulated data prepared by a registered professional engineer for the soil type encountered.
  - Designed using the Manufacturer's tabulated data for the soil conditions encountered
  - Designed by a registered professional engineer.
  - At least one copy of the information, including the identity of the registered professional engineer who approved the data, must be kept at the work site during installation of the protective system. Upon completion of the system, the data may be stored away from the job site, but a copy must be made available.
- 6.** A trench shield (or trench box) may be used which has either been:
- Designed or approved by a registered professional engineer
  - Construction is based on tabulated data prepared or approved by a registered professional engineer
- 7.** Shoring systems and trench shields must extend down to within two feet of the bottom of the excavation and eighteen inches above the top of vertical banks.
- 8.** Excavation below the level of the base or footing of any foundation or retaining wall is prohibited unless a support system such as underpinning is provided, the excavation is in stable rock, or a registered professional engineer determines that the structure is sufficiently removed from the excavation. They must also determine if the excavation will not pose a hazard to employee-owners or the structure.
- 9.** Excavations under sidewalks and pavements are also prohibited unless an appropriately designed support system is provided, or another effective method is used.



- 
10. Whenever support systems, shield systems, or other protective systems are being used, a copy of the manufacturer's specifications, recommendations, and limitations must be in written form and maintained at the job site.

### **Existing Utilities**

Before excavation begins, the supervisor or competent person will determine the estimated location of utility installations e.g. sewer, telephone, fuel lines, underground and overhead electric power lines, water lines, or any other underground installations that may be encountered during excavation. Additionally, before starting the excavation, the supervisor must contact the utility companies or utility owners involved and inform them, within established or customary local response times, of the proposed work. Utility companies or owners must be asked to locate underground utilities and allow at least 48 business hours for them to do so before excavation work is started. Most communities and utility service companies use a one-call number for locating service lines.

1. If they cannot find the exact location of the utility installations, the supervisor may proceed with caution. Senior project management in consultation with a company safety representative must use safe and acceptable means to locate the underground installations before excavating/trenching such as calling 811, hand probing, hand digging, or potholing.
2. If underground installations are exposed during excavation or trenching, they will be removed, protected, or properly supported.

### **Safety Considerations**

1. The supervisor must determine the amount and type of safety equipment required for the excavation and trenching operation. No matter how many trenching, shoring, and backfilling jobs have been done in the past, each job must be approached with the utmost care and preparation. Consideration must be made for the following as a minimum:
  - The competent person must perform soil analysis testing to determine the type of soil unless class C soil is chosen.



- 
- The Project Excavation Checklist must be completed prior to entry every day.
  - Type of soil
  - Type of bank protection required
  - Employee-owner access and egress
  - Location of equipment, materials, and stockpiles
  - Possibility of finding hazardous atmospheres
    - i) Atmospheric testing equipment
    - ii) Rescue equipment (harness, lifeline, tripod, and similar equipment)
  - Rescue procedures in case of an injury or cave-in
  - Personal protective equipment requirements
    - iii) Safety vests
    - iv) Hard hats
    - v) Safety glasses
    - vi) Work Boots
    - vii) Retrieval System and harness
- 2.** Operators must be trained in the proper and safe operation of any equipment, which they might be expected to operate during the excavation and trenching operation.
  - 3.** A competent person for excavation and trenching must be on-site during excavation and trenching operations.
  - 4.** Adequate precautions must be in place to protect employee-owners working in excavations against the hazards posed by water accumulation.
  - 5.** Employee-owners must be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations.



- 
- a. Provide protection by placing and keeping such materials or equipment at least two (2') feet from the edge of excavations.
  - b. Flag person or stop logs must be provided when equipment approaches the edge of an excavation (such as dumping backfill material).
6. A stairway, ladder, or ramp must be used as a means of access or egress in trench excavations that are four feet or more in-depth. The ladder(s), stairways(s), or ramp must be spaced so that no employee-owner in the excavation/trench is more than 25 feet in travel distance away. When ladder(s) are employed, the top of the ladder must extend a minimum of three feet above the upper lander surface to which the ladder is used to gain access and be properly secured from movement.
7. Employee-owners must not be permitted underneath loads handled by lifting or digging equipment.
- a. Employee-owners must be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling material.
  - b. Employee-owners may remain in cab of trucks equipped with a bed extension designed to protect the cab.
8. Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning must be provided to ensure the stability of such structures for the protection of employee-owners. A qualified engineer will design such systems.
9. Sidewalks, pavement, and similar structures may not be undermined unless a support system such as shoring is provided to protect employee-owners from possible collapse.

### **Permit Requirements**

Requirements listed in the Confined Space Entry Section (specifically permit-required confined space) of this manual will be followed for excavations/trenches suspected or



---

susceptible to oxygen deficiency (less than 19.5% oxygen) and/or subject to the accumulation of toxic or flammable vapors.

### **Protective Systems**

The major cause of serious injury to, or death of an employee-owner working in an excavation/trench is from cave-ins. Due to the seriousness of this type of accident, the following requirements must be met:

### **Training Requirements**

1. Competent Person – Company provided or outside competent person training class before being assigned as a competent person and refresher training as determined by management.
2. Employee-owners involved in excavation activities – Must receive excavation and trenching safe operation training before entering an excavation or trench.

### **Installation and Removal of Protective Systems**

1. The following procedures are required for the protection of employee-owners when installing support systems:
  - Securely connect members of support systems
  - Safely install support systems
  - Never overload members of support systems
  - Install other structural members to carry loads imposed on the support system when temporary removal of individual members is necessary
  - Installation must take place from the top down. No employee-owners will be allowed in the excavation until the installation is complete.
2. As soon as work is completed, the excavation should be backfilled as the protective system is dismantled.
  - Employee-owners should slowly remove the protective system from the bottom up, taking care to release members slowly.
  - Remove shoring at a rate consistent with the backfilling operation.



---

## Inspection Requirements

1. A competent person must perform the following inspections:
  - Perform at least daily inspection of protection equipment, trench conditions, and adjacent areas.
  - Inspections must be made before the start of work and as needed throughout the shift including atmosphere testing whenever oxygen deficiency and/or accumulation of toxic or flammable vapors is suspected.
  - Inspections must be made after every rainstorm or other hazard-increasing occurrence.
2. Excavations left open more than three days will be inspected for shrinkage and soil sloughing.
3. The competent person must:
  - Remove employee-owners from hazardous conditions and make changes necessary to ensure their safety
  - Categorize soil conditions and conduct visual and manual tests
  - Determine the appropriate protection system to be used
  - Obtain appropriate permits when needed
  - Maintain on-site records of inspections and protective systems used

## Materials and Equipment

The site supervisor or designee is responsible for the safe condition of materials and equipment used for protective systems. Defective and damaged materials and equipment can fail a protective system. To avoid possible failure of a protective system we must ensure that:

- Materials and equipment are free from damage or defects
- Manufactured materials and equipment are used and maintained in a manner consistent with the recommendations of the manufacturer
- While in operation, materials and equipment are examined by a competent person to determine if they are suitable for continued use



- 
- Materials and equipment which are not safe for use are removed from service
  - Damaged materials are not returned to service without the evaluation and approval of a registered professional engineer

### **Signs and Barricades**

Signs and barricades required by this section must meet the requirement of the section titled “Signs, Signals and Barricades”.

- Excavations, which are obstructed from the view of employee-owners either on foot or in a vehicle, must be barricaded or fenced.
- No excavation will be left open overnight without substantial barricades and/or warning signs being placed along open sides to prevent entry.
- Confined space “Permit Required Before Entry” signs must be placed at the access points to excavations, which have or have reasonable expectations to contain hazardous atmospheres.

The Excavation Checklist will be completed by a competent person. The form is located inside the HCSS FORMS system.





---

## 10. Demolition

### **Policy (Refer to Dust Control Measures)**

All demolition work shall be carefully evaluated to identify potential hazards and environmental concerns before the start of work. Adequate safeguards must be established and implemented to protect the safety and well-being of the personnel involved and protect the environment.

### **Responsibilities**

#### ***Safety Director/Designee***

The Safety Director or designee shall serve as a resource to project personnel on safety, industrial hygiene, medical surveillance, and environmental issues.

#### ***Project Manager/Superintendent***

The Project Manager and/or Superintendent will work closely with the Competent Person to ensure maximum safeguards are in place during demolition work. He/she will also ensure that provisions are in place for medical care on and off the job site, should it be needed.

#### ***Competent Person***

The planning, safeguarding, and actual work of the demolition project will be under the supervision of the Competent Person. He/she will ensure that necessary items such as an engineering survey, hazardous material testing, shoring, glass removal, and others listed in this procedure are completed so that employee-owners are protected from associated hazards.

#### ***Foremen***

Each foreman will ensure that required safeguards and safe work practices are communicated to the work crew before performing tasks and monitoring compliance with company and job-specific safety policies and procedures.

### **General Requirements**

1. Before permitting employee-owners to start demolition work, an engineering survey will be made by a competent person. The purpose is to evaluate the structure to determine the condition of framing, bracing, columns and beams for



- 
- the possibility of an unplanned collapse of any portion of the structure. The qualified engineer will develop a formal demolition plan that describes the process (means and methods) to be followed to prevent unintentional collapse.
2. Any adjacent structure exposing employee-owners to the danger of unplanned collapse or other demolition-associated hazards will also be included in the engineering survey.
  3. The required engineering survey will be documented and maintained at the job site for reference, review, and inspection.
  4. When employee-owners are required to work within a structure to be demolished that has been damaged by fire, flood, explosion, or other cause, the walls, bridge deck, beams, columns, and other structural members will be shored and/or braced as necessary to prevent an unplanned collapse.
  5. The appropriate utility company will be notified if the possibility exists of affecting their service lines. Any temporary utilities necessary for demolition operations will be relocated and protected as necessary and according to codes and regulations.
  6. Testing will be performed as necessary to ensure that hazardous materials are removed, including piping and containers, and that remaining piping, vaults, and equipment will be tested to ensure safe operations and to prevent employee-owners health exposures (such as asphyxiation from inert gas, fire, explosion and to prevent exposure to asbestos and toxic chemical vapors).
  7. Glass will be removed as appropriate to prevent exposures associated with broken glass.
  8. Wall and floor openings will be protected as stipulated in this manual and/or the appropriate fall arrest system utilized.
  9. Materials will not be dropped from excessive heights (heights that can cause the falling materials to drift outside the protected drop area - such as heights easily affected by wind). Material drop areas will be completely enclosed with barricades not less than 42" high and not less than 12 feet back from the projected edge of the opening above. Signs, warning of the hazard of falling



---

materials, will be posted on each side of the drop area to warn of the hazard. Signs and barricades will not be removed until debris handling is stopped or completed.

10. Except for cutting chute holes, material drop holes, storage space preparation, and similar work, the demolition will begin at the top of the structure and proceed downward.
11. Each level of deck, beam, and column construction will be removed, and debris removed before commencing the removal of the next structure below.
12. Employee-owner entrances to multilevel structures being demolished will have employee-owner access points designated to prevent unintentional hazard exposures.
13. No employee-owners and/or other personnel will be allowed to work under or directly adjacent to a structure being demolished.
14. Mechanical equipment will not be used on bridge decks or working surfaces unless they are of sufficient strength to support the imposed equipment load as determined by a qualified engineer.

Mechanical equipment used will meet the safety requirements specified in this manual and applicable OSHA standards.

Personnel performing hand demolition operations will utilize the proper personal protective equipment as determined in a completed Job Safety Analysis. This includes the use of fall arrest systems and anchor points.

Integrity of the structure will be ensured through pre-demolition engineering survey, regular inspection of the structure by competent persons to identify hazards and instability, and by the use of adequate temporary bracing.

Cranes, derricks, and other hoisting equipment used will meet the requirements specified in this manual and in compliance with the manufacturer's recommendations.

Steel construction will be dismantled column length by column length and tier by tier (column lengths may be two-story lengths).

Any structural member being dismembered will not be overstressed.



---

## Access

1. Only designated scaffold stairs or ladders will be used by employee/owners for access and egress.
2. They will be regularly inspected (at least daily) and properly maintained in a safe condition and in compliance with the requirements contained in this manual and in the OSHA 1926 standards.
3. Natural light or artificial lighting will properly illuminate work areas and access/egress points. As a minimum, the bridge deck, supporting structure, and surrounding ground area will be adequately lit.

## Chutes

For most heavy/highway operations, demolitions of structures do not normally require the use of chutes, however, this section is provided to address such use when necessary for special conditions.

1. No material will be dropped to any point lying outside the exterior of the structure unless the area is effectively protected.
2. Any material chute with an angle of more than 45° from horizontal will be completely enclosed except for floor-level openings equipped with doors used to insert materials. The bridge deck level opening(s) will not exceed 48". All chute doors will be kept closed when not in use.
3. A substantial gate will be installed in each chute at the discharge end. A competent person will be assigned to control the operation of the gate and the backing and loading of trucks.
4. When not in use, the area surrounding the chute discharge end will be closed off and secured.
5. Substantial guardrails will protect chute openings and will be at least 42" high. Any openings between the bridge deck and the chute will be solidly covered.
6. Where materials are dumped from mechanical equipment or wheelbarrows, a securely attached toe board or bumper, not less than 4" thick and 6" high will be provided at each chute opening.



- 
7. Chutes will be designed and constructed of such strength as to eliminate failure due to the impact of materials or debris loaded therein.

### **Removal of Materials through Bridge Deck Openings**

1. Deck openings will be designed by a qualified engineer and will not create structural instability or the potential for collapse.
2. Project prints and drawings will contain the appropriate information concerning the location and dimensions of deck openings as designed or designated by the qualified engineer.

### **Removal of Bridge Deck (Paving and Pans), Caps and Columns**

1. Debris will not be permitted to fall upon and/or be stored on the bridge deck in such mass as to exceed the loading capacity.
2. Unstable caps and/or columns will not be permitted to stand alone without lateral bracing unless such structural component was originally designed and constructed to stand without such lateral support and is in a condition safe enough to be self-supporting.
3. Sections of the bridge deck, caps, and columns will be left in a stable condition at the end of each shift.
4. Employee-owners will not work on structural demolition when weather conditions constitute a hazard such as ice, snow, rain, high winds, lightning, etc.
5. Unnecessary employee-owners will be kept out of the demolition area.
6. Bridges of "skeleton-steel" construction may allow the steel framing to be left in place during the demolition of masonry. Where this is done, steel beams, girders, and similar structural supports will be cleared of loose material as the masonry demolition progresses downward. A competent person must decide as to the integrity of the steel skeleton before demolition proceeds.
7. Scaffold stairs or ladders will be provided for access and egress.
8. Walls, which serve as retaining walls to support earth or adjoining structures, will not be demolished until such earth has been properly underpinned or removed.



- 
9. Walls erected to serve as retaining walls against which debris will be piled will not be so used unless capable of safely supporting the applied load.

### **Demolition by Explosives**

1. Explosives are not normally used on Austin-controlled projects. Such operations require the use of specialized subcontractors.
2. If the use of explosives is contemplated for any project/job, prior approval must be obtained from the Company President in consultation with the Safety, Health, and Environmental Director.



---

## 11. Health and Environment

### Medical Services

1. Provisions must be made before the commencement of the project for prompt medical attention. Contact a company representative for assistance in locating doctors and hospitals in the area.
2. The telephone numbers of the clinic, doctors, hospitals, and ambulances must be posted at all job sites or project office telephones or in each foreman or superintendent's vehicle for jobs not having an office.
3. Onsite supervision must receive first aid and CPR training and that training will be documented on training cards issued after approved courses and entered into the company's training records.
4. Emergency response capabilities must be contemplated, and responses planned prior to project/job start-up (including potential natural disaster and weather-related events in addition to potential job site accidents).

### First Aid

1. First aid supplies will be available, maintained in a sanitary condition, and re-supplied when used at all work locations. Contact the company safety representative for assistance in selecting the appropriate type and quantity of supplies necessary for the construction project.
2. First aid is the immediate and temporary care given to the victim of an accident or sudden illness until the services of a doctor can be obtained. Often an accident victim is hurt rather than helped by persons who want to do something but do not know how to render first aid properly. Individuals trained in first aid will be able to find out what the injuries are, know how to give temporary care for the injuries and know how to transport the victim without causing further injury. Due to the nature of the construction industry, transportation is often a major problem when an injury occurs in excavations or on high structures. In addition to knowing what to do, it is just as important to know what not to do in the case of an injury. If it is apparent that moving the injured person immediately will aggravate the injury



---

and he or she is not in an imminent hazard, then it is usually best for the victim to be made as comfortable as possible until professional caregivers arrive.

3. Job sites doing work on elevated structures or in excavations must provide for removing an injured person. This may be accomplished by having a basket-type litter on-site or pre-arranging with a local fire department and/or ambulance service to ensure they have the proper equipment and can respond promptly.
4. Precautions must be taken to protect the provider of first aid from communicable diseases. Protective gloves, masks, and eye protection must be available to all first aid trained employee-owners (see the Bloodborne Pathogen Procedure) and must be used by the first aid attendant to protect from potential infection due to exposure to contaminated blood products. Airways must be provided to allow for resuscitation without requiring direct mouth-to-mouth contact. Waste containers labeled with the biohazard emblem must be used for first aid products or waste material, which contain body fluids such as blood. Contact the company safety representative to advise and assist with personal protective equipment supplies and medical waste disposal.
5. Emergency phone numbers, including the following, must be posted at all projects (even if 911 is used):
  - Ambulance service
  - Project doctor
  - Hospital
  - Law enforcement agency
  - Fire department

### **Emergency Notification**

Project superintendents will ensure that all supervisors are aware of the company's emergency call-out system. Appropriate emergency phone numbers will be available at every job/project in addition to the local emergency response personnel such as the fire department and police department.





---

## Sanitation

1. Drinking water:
  - a. An adequate supply of individual water bottles is provided for all EO's
2. Toilets
  - a. Under temporary field conditions, provisions must be made to ensure that at least one toilet facility is available.
  - b. Toilets must be provided for employee-owners according to the following table
    - i) 20 or fewer employee-owners – one toilet
    - ii) 21 or more employee-owners – one toilet seat and one urinal per 40 workers
    - iii) 200 or more employee-owners – one toilet seat and one urinal per 50 workers
  - c. Waste disposal may not cause ground contamination and must comply with local sanitary codes.
  - d. Hand washing stations equipped with soap and water must be provided whenever personnel work with hazardous materials such as lead, asbestos, silica, or other harmful chemicals or substances.

## Illumination

Operations whether performed in the daytime or at night, require adequate illumination so as not to cause injury. Light can be provided by permanent, temporary, or spot sources. When necessary, equipment is available to measure light intensity. Questions regarding illumination should be directed to your company safety representative.

## Ventilation and Air Quality

Adequate ventilation must be provided in areas where excessive amounts of contaminants exist. Contaminants include cement or lime dust, blowing dirt, welding fumes, carbon monoxide, and chemical vapors. Contact your company safety representative to conduct an evaluation of air contaminants and to make recommendations to protect employee-owners from such exposures.



---

## 12. Hazard Communication

### General Requirements

A hazardous material is a substance with known hazardous characteristics, such as those materials listed by an environmental, health, and safety regulator or research institutions and associations. If a substance has one or more of the following characteristics, it should be considered a hazardous material:

- Flammable/Combustible
- Corrosive
- Incompatible (reacts with other materials violently); and/or
- Is toxic.

AB&R is responsible for ensuring employees/owners receive Hazard Communication training before work. The required training must be designed to ensure worker knowledge (before exposure) of chemical and material health hazards associated with what they use and what protection is required.

AB&R training records will be maintained within HCSS.

Contractors working on a project must have a written hazard communication program. The SDS material must be available for review by the project manager, superintendent, employee/owners, or a company safety representative. The required hazard communication program will consist of at least:

- A written program;
- A chemical list;
- Corresponding SDS (most recent edition) for materials on the chemical list; and
- Training Documentation.

Each subcontractor will share their hazard communication information with other contractors having workers exposed to hazardous materials used in their operations.



---

Hazardous materials used on a project must be handled, applied, and stored per the manufacturer's recommendations contained in the Safety Data Sheet (SDS) and warning labels.










Hazardous materials in use on the project must be labeled. Each container label must list the specified pictogram, hazard statement, signal word, and precautionary statement for each hazard class and category. Labels cannot be distorted such that the contents and hazard warnings are not legible.

Labels will require the following elements:

- **Pictogram:** a symbol plus other graphic elements, such as a border, background pattern, or color that is intended to convey specific information about the hazards of a chemical. Each pictogram consists of a different symbol on a white background within a red square frame set on a point (i.e. a red diamond). There are nine pictograms under the GHS. However, only eight pictograms are required under the HCS.
- **Signal words:** a single word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used are "danger" and "warning." "Danger" is used for the more severe hazards, while "warning" is used for less severe hazards.
- **Hazard Statement:** a statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.
- **Precautionary Statement:** a phrase that describes recommended measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage or handling of a hazardous chemical

**Figure 1**

*HCS Pictograms and Hazards*

<p><b>Health Hazard</b></p>  <ul style="list-style-type: none"> <li>• Carcinogen</li> <li>• Mutagenicity</li> <li>• Reproductive Toxicity</li> <li>• Respiratory Sensitizer</li> <li>• Target Organ Toxicity</li> <li>• Aspiration Toxicity</li> </ul>	<p><b>Flame</b></p>  <ul style="list-style-type: none"> <li>• Flammables</li> <li>• Pyrophoric</li> <li>• Self-Heating</li> <li>• Emits Flammable Gas</li> <li>• Self-Reactive</li> <li>• Organic Peroxides</li> </ul>	<p><b>Exclamation Mark</b></p>  <ul style="list-style-type: none"> <li>• Irritant (skin and eye)</li> <li>• Skin Sensitizer</li> <li>• Acute Toxicity (harmful)</li> <li>• Narcotic Effects</li> <li>• Respiratory Tract Irritant</li> <li>• Hazardous to Ozone Layer</li> <li>• (Non-Mandatory)</li> </ul>
<p><b>Gas Cylinder</b></p>  <ul style="list-style-type: none"> <li>• Gases under Pressure</li> </ul>	<p><b>Corrosion</b></p>  <ul style="list-style-type: none"> <li>• Skin Corrosion/ burns</li> <li>• Eye Damage</li> <li>• Corrosive to Metals</li> </ul>	<p><b>Exploding Bomb</b></p>  <ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self-Reactive</li> <li>• Organic Peroxides</li> </ul>
<p><b>Flame over Circle</b></p>  <ul style="list-style-type: none"> <li>• Oxidizers</li> </ul>	<p><b>Environment (Non Mandatory)</b></p>  <ul style="list-style-type: none"> <li>• Aquatic Toxicity</li> </ul>	<p><b>Skull and Crossbones</b></p>  <ul style="list-style-type: none"> <li>• Acute Toxicity (fatal or toxic)</li> </ul>



---

The written hazard communication program must address a system for informing workers of the SDS information when a new hazardous material is introduced and/or conditions of use change (such as included in a Job Safety Analysis process).

Safety inspections will include a review of program effectiveness and compliance whenever it is noted that a hazardous material is being used during the inspection process.

### **Program Components**

The project manager or superintendent at the site will ensure the following:

1. Maintenance of a current chemical list:
  - Identify hazardous materials on the project to which our employee/owners could be exposed (regardless of what contractor is actually using the material).
  - Create a list of these substances in a master file.
2. Safety Data Sheets (SDS):
  - Obtain a copy of the Safety Data Sheets (SDS) from the manufacturers, wholesalers and /or suppliers for each hazardous chemical/substance on the Chemical list.
  - Create a file or book with the SDS Sheets to be stored in a central job location using the chemical list as an index.
  - Organize and maintain the file or book in a manner that will facilitate easy reference and quick retrieval during emergencies.
  - Make the SDS file or book available for supervisors' reference and employee/owner review.
  - Provide copies of SDS's as requested to affected employee/owners.

The direct supervisor (foreman) will ensure the following:

3. Employee/owner training (containing three components) which must be carried out:



- 
- General Orientation conducted by the superintendent, safety representative and/or foreman (depending on the size of the project):
    - i) An explanation of hazardous chemicals/substances used on the project (can be by categories of materials).
    - ii) General explanation of SDS's, how they are maintained, where they are stored, who is responsible for the program, and how to request information.
    - iii) General engineering, administrative, and/or PPE controls should be introduced.
    - iv) Location and issuing procedures for personal protective equipment.
    - v) Review of container labeling and the importance of reading labels.
    - vi) Emergency clean-up procedures for spills.
    - vii) Employees/owners should be encouraged to ask questions whenever in doubt.
  - Specific Orientation
    - viii) Conducted by direct supervision (foreman):
    - ix) Specific hazardous chemicals/substances used by the craft are pointed out (used in routine and non-routine work assignments).
    - x) Explanation of engineering/ administrative/PPE equipment (exposure controls).
    - xi) Specific hazardous chemicals/substances involved in non-routine tasks.
    - xii) Emergency procedures to be followed.
  - Continuing Education
    - xiii) Must be a component of the Toolbox Supervisors Safety Meetings and/or the JSA process and must cover a specific hazardous



---

chemical/substance used by the craft or crew when introduced and prior to use, covering routine and non-routine work assignments.

- xiv) The supervisor must be provided a copy of the SDS for reference to conduct the required training.
- xv) The supervisor must review container labeling to include any temporary labeling system used at the project.
- xvi) Exposure controls must also be reviewed when new hazardous materials are introduced into the workplace and prior to use by the employee/owner.

**4. Posting Notice:**

- A notice must be posted on a bulletin board stating that employee/owners have the right to review SDS's.
- The notice must state where the SDS Sheets are kept on the project.
- The notice must also provide instructions on how to obtain a copy or review the SDS Sheets.
- The notice will also stipulate that any medical record maintained by the company is available for review and/or copying as requested, and the name of the person to contact (other than the foreman) must be included on the notice.

**Responsibilities**

1. The project manager is to ensure that the Hazard Communication Program is complied with and that the procedures outlined in this section are implemented by the appropriate contractor (including Austin Bridge & Road):
2. The contractor who receives the material must:
  - Ensure that the container is labeled, tagged or marked with the following information:
    - i) Identity of the hazardous material - chemical.
    - ii) Specified pictogram.



- 
- iii) Hazard statement.
  - iv) Signal word and precautionary statement for each hazard class and category.
- 3.** Each contractor and subcontractor must designate an individual to maintain a copy of their written program, chemical list, and SDS files. This material must be kept updated. Larger Austin projects may maintain a central HAZ COM file for the subcontractors working at the project site. If this is the case, subcontractors must be informed to supply copies of their program to the designated Austin representative prior to commencing work activities at the site.
- 4.** Our project manager or superintendent and the subcontractor's senior site supervisor must ensure that their employee/owners or workers have been informed and trained regarding:
- Hazardous substances used or to which employees/owners or workers under their direction may be exposed in routine and non-routine work assignments.
  - Personal protective equipment required.
  - Enforcement procedures and policies. Foreman must ensure that required personal protective equipment (PPE) is provided and used by employees/owners or workers.
- 5.** Employee/owners and/or worker responsibility:
- Maintain the labels during their work assignments of products used.
  - To follow the instructions and to use the personal protective equipment (PPE) required.
  - Ask for instructions from their supervisor if they are unsure about a product or the requirements for use.
- 6.** The company safety representative will assist the project manager/superintendent as required to ensure the implementation of this program.





---

## **Personal Protective Equipment**

Manufacturer's recommendations contained in the SDS will be followed to protect employees/owners and workers.

Refer to the section of this manual titled "Personal Protective Equipment".

## **Personal Hygiene**

- Use appropriate protective clothing as required.
- DO NOT share equipment.
- Immediately remove contaminated clothing.
- Wash before going on break, eating, drinking, or applying make-up.
- Never take food into a hazardous work area.
- Never smoke in a work area if chemicals are present. Leave cigarettes in the storage area.
- Clean up spills immediately and keep the work area clean.

## **Chemical Spills Clean-Up Procedures**

Train employee/owners and/or workers beforehand, regarding clean-up procedures. Follow the recommendations contained in the SDS's, company environmental policy and procedures or according to client specifications agreed to by the Company Safety, Health and Environmental Director.

- Evacuate the immediate area.
- Eliminate sources of ignition.
- Do not leave material unattended.
- Persons trained and equipped with protective equipment must do clean up.
- Use absorbent or neutralizer as soon as possible.
- Contain the spill.
- Pick up absorbent or neutralizer and place into designated container and label.



- 
- Wash off tools (some tools must be thrown away when cleaning up a corrosive spill).
  - Wash down area.

### **Summary of Procedure**

1. Identify hazardous substances (supervising foreman).
  - Compile a list of hazardous substances found on the job site. This list may be in the form of an index in the SDS book or file cabinet (project manager/superintendent designee).
  - Obtain safety data sheets from suppliers and/or manufacturers (project manager/superintendent designee).
  - Post or file the hazardous substance list on the job site. Post directions for obtaining copies of the safety data sheets from a central location or set up a file at the job site and provide SDS's whenever requested by an employee/owner (project manager/superintendent designee).
  - Train employee/owners and/or workers before exposure (foreman).
  - New employee/owner or workers assigned or transferred must attend an orientation session(s).
  - When new hazardous materials are introduced into the work, discuss these products during the Toolbox Safety Meetings and/or documented Job Safety Analysis before exposure.
  - Provide personnel with protective safety equipment and train them in the use and maintenance of the equipment when alternatives to the use of the hazardous substance cannot be made e.g. substituting a less hazardous chemical that will do the same job (foreman).
  - Ensure that proper labels are used to identify hazardous substances and that every employee/owner understands how to read and follow directions. Ensure that labels are readable and not torn or covered over by over-running contents (foreman).



- 
- Develop a system for labeling temporary containers when allowed for use (project manager/superintendent or designee).
  - Post chemical list and availability for personnel to see (project manager/superintendent or designee).
  - Obtain SDS when hazardous materials are ordered (foreman who orders supplies and/or purchasing agent).
  - Receive hazardous materials only with accompanying SDS (foreman and/or receiving agent).
- 2.** Assure hazard communication understanding and compliance among contractors at the site (project manager/superintendent).



---

## 13. Respiratory Protection Program

### Policy

When engineering controls are not feasible or practical to eliminate or control employee exposures to hazardous atmospheres, appropriate respiratory protection shall be provided in accordance with OSHA 29 CFR 1910.134, Respiratory Protection.

### Responsibilities

#### ***Safety Director/Designee***

The Safety Director or designee is responsible for:

- Providing Industrial Hygiene and Medical Surveillance and fit testing resources to site personnel where required
- Providing training materials on Respiratory Protection when required
- Maintaining employee medical and exposure records

#### ***Project Manager/Superintendent***

It is the responsibility of the Project Manager or Superintendent in consultation with the safety department to determine respiratory needs for each project. Where needed, a Respiratory Program Administrator will be appointed.

#### ***Respiratory Program Administrator (Competent Person)***

The Respiratory Program Administrator will assess respiratory hazards and safeguards along with any medical evaluations and fit testing applicable to a project. He/she will assist with the selection of respirators, fitting, and training all site employee-owners.

The Respiratory Program Administrator will retain all job site records at the job location until the job ends, at which time they will be forwarded to corporate safety for retention. He/she will ensure all aspects of this procedure are adhered to (i.e., respirator selection, maintenance, cleaning, use [employee training], fit testing, medical evaluations and recordkeeping). At the job conclusion, all records will be forwarded to the company safety office.



---

## ***Foremen***

Foremen are responsible for verifying their employees are trained in the requirements of this procedure and wear the appropriate respiratory protection whenever required.

### **General Requirements**

A project where respirators are utilized will have a designated Respirator Program Administrator (competent person), responsible for the respirator protection program. Projects large enough for a full-time company safety representative may designate that person as the respirator-competent person. Otherwise, the Project Manager in consultation with a company safety representative will make the selection of the competent person based on training and experience.

The Respirator Competent Person will make periodic, on-site evaluations of the respirator user and exposure environment and correct any recognized problems. Such problems and corrections will be noted in the project safety files for future reference and inspection. The intensity of this surveillance will be tailored to the hazards present (the more dangerous, the more surveillance required).

The Respirator Competent Person/Program Administrator must make inspections during respirator use to determine if the program is effective. This can be a part of a normally scheduled safety inspection. However, these evaluations must involve discussions with users to determine their level of understanding. Employee-owners not complying with this policy-procedure will receive additional training to ensure compliance.

If the respirator fails to function properly, for any reason, the employee-owner is to leave the exposure area immediately and report the problem to the Respirator Competent Person/Program Administrator.

Normally, control of atmospheric contaminants (vapors, fumes, dusts, mists, smoke, fog, and gases) is accomplished through the use of engineering controls (such as local exhaust ventilation).

OSHA defines dust masks as a filtering face piece. This means a negative pressure particulate respirator with a filter as an integral part of the face piece, or the entire facepiece composed of the filtering medium would be classified as a respirator.



---

Austin Bridge & Road will provide the appropriate respiratory protection to employee-owners after proper medical surveillance and appropriate job site testing. This will ensure proper fit, use, and exposure protection.

Only NIOSH-certified respirators used in compliance with the conditions of its certification are to be used.

Respiratory hazards in the workplace will be identified via one or more of the following: Testing of the work environment, SDS review, Job Hazard Analysis, or other acceptable methodology which will include a reasonable estimate of the employee-owner's exposures and identification of the contaminant's chemical state and physical form. In situations where we cannot adequately estimate the employee-owners exposure, we will consider the exposure to be Immediately Dangerous to Life and Health (IDLH) until test results indicate otherwise.

The respirator supplied to the employee-owner will be acceptable to the person who has to wear it and correctly fit the user's face.

To select an appropriate respirator.

- Conduct an exposure assessment to determine the type and amount of hazardous substance
- Take into account the factors that can influence respirator selection such as worker characteristics
- Understand the respirator's assigned protection factors
- Know the various kinds of respirators and their relevant characteristics

Employee-owners must be clean-shaven. No facial hair can come between the face and the sealing surface of the respirator's face piece. Eyeglasses and facial scars cannot interfere with the respirator's face seal.

Employee-owners who use a tight-fitting respirator need to perform a "user seal check" to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks recommended by the manufacturer (provided it is as equally effective) or the following must be used.



- 
- Positive Pressure Check- Close off the exhalation valve and exhale gently into the face piece. The fit is considered satisfactory if a slight positive pressure can build up inside the face piece without any evidence of outward leakage of air at the seal. For most respirators, this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.
  - Negative Pressure Check- Close off the inlet opening of the canister or cartridge(s) by covering with the palms of the hands or by replacing the filter seal(s), inhale gently so that the face piece collapses slightly, and hold the breath for ten seconds. If the design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand, the test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.
  - User seal checks are not substitutes for qualitative or quantitative fit tests (see Fit Testing).

Employee-owners will not remove any required respiratory protection until out of the exposure area.

Employee-owners must not work in IDLH environments. Any variance to this requirement will require consultation with and approval of a company safety representative.

Canisters, cartridges, and filters will be properly identified as being NIOSH approved (on the label) and the label will be maintained in readable condition (not removed, obscured, and/or defaced).

### **Respirators for Immediately Dangerous to Life and Health (IDLH) Atmospheres**

1. Oxygen-deficient atmospheres will be considered IDLH. Any exposure below 19.5% O<sub>2</sub> concentration by volume will be considered deficient.
2. A full-face, pressure demand, Self-Contained Breathing Apparatus (SCBA) certified by NIOSH with a minimum air supply of 30 minutes or a combination full-



---

face piece pressure demand Supplied Air Respirator (SAR) with emergency self-contained air supply will be the only approved respirators for IDLH use.

3. Compressed breathing air shall meet the requirements for Type 1-Grade D breathing air as described in ANSI/CGA Commodity Specification for Air, G-7.1-1989.
4. Where exposures cannot be identified or reasonably estimated, the atmosphere will be considered immediately dangerous to life or health (IDLH).

### **Respirators for Atmospheres that are not IDLH**

1. The respirator will be appropriate for the chemical state and physical condition of the contaminant.
2. For protection against gases and vapors, we will provide:
  - a. An atmosphere-supplying respirator
  - b. An air purifying respirator provided the respirator is equipped with an end-of-service life indicator (ESLI) certified by NIOSH for the contaminant, or if there is no ESLI, a change schedule is implemented for canisters/cartridges that ensures change out before the end of the service life.
3. For protection against particulates, we will provide:
  - a. An atmosphere supplying a respirator
  - b. An air-purifying respirator equipped with a NIOSH-certified high-efficiency particulate air (HEPA) cartridge, or an air-purifying respirator equipped with NIOSH certification for the particulates.
4. The assigned Protection Factors for the respirator(s) to be used will not be exceeded (check the manufacturer's specifications).

### **Medical Requirements**

1. Employee-owners required to wear respirators must be evaluated by a licensed physician and/or other licensed medical provider operating within the scope of their license. No Employee-owner may wear a respirator unless evaluated and approved by a licensed physician and/or other licensed medical provider.





- 
2. The company safety representative will designate the medical provider responsible for evaluating Employee-owners ability to wear respirators for each job site. The project manager and/or respirator-competent person will consult with the safety representative to schedule the necessary evaluations. The medical provider will be given a copy of this procedure and a copy of the OSHA respiratory protection standard.
  3. Employee-owners to be evaluated for respirator use will answer the medical questionnaire contained in the OSHA 1926.103 standard or one provided by the medical provider as long as it covers at least the same information required by the questionnaire contained in the OSHA standard.
  4. A follow-up medical examination or additional medical evaluation will be conducted for those employee-owners giving a positive response for questions 1-8 and 10-15 Part A, Section 2 and questions contained in Part B (if used by the medical provider) of the OSHA medical questionnaire or whose initial medical examination demonstrates the need for a follow-up medical examination.
  5. The follow-up medical examination will include any medical tests, consultation, and/or diagnostic procedures that the medical provider deems necessary to make a final determination.
  6. The medical questionnaire and examination are confidential. The medical evaluations will be conducted during regular working hours. The questionnaire will be administered in a manner that ensures the employee-owner's capability to understand the content.
  7. The employee-owner will be allowed to review and discuss the results with the medical provider.
  8. The following information will be provided to the medical provider before determining the employee-owner's ability to use a respirator:
    - a. The type and weight of the respirator to be used by the employee-owner
    - b. The duration and frequency of use
    - c. The expected physical work effort



- 
- d. Additional protective equipment and clothing to be worn
  - e. Temperature and humidity extremes that may be encountered
  - f. Additional information requested by the medical provider
- 9.** The medical provider will provide a written recommendation regarding the employee-owner's ability to use a respirator. The recommendation will provide the following information:
- a. Limitations on use related to a medical condition and/or workplace conditions in which the respirator will be used, including whether the employee-owner is medically able to use the respirator
  - b. The need for follow-up medical evaluations
  - c. A statement that the medical provider has given a copy of the written recommendation to the employee-owner
- 10.** A PAPR (Powered Air-Purifying Respirator) type respirator will be provided for those employee-owners not able to use a negative pressure respirator.
- 11.** Medical evaluations will be provided for the following:
- a. The employee-owner reports signs and symptoms related to their ability to use the respirator
  - b. The respiratory program competent person informs us that the employee-owner needs to be reevaluated
  - c. Information gained from the use of the respiratory protection program such as observation, inspection, or program evaluation indicates a need for reevaluation.
  - d. A change occurs in workplace conditions that may result in the increased physiological burden placed on the employee-owner
- 12.** Medical information concerning an employee-owner is confidential. It will not be disclosed to anyone other than the medical provider or AB&R personnel administering this policy and program.



---

## **Maintenance and Care of Respirators:**

1. Cleaning, disinfecting, storage, inspection, and repair for respirators used by employee-owners must be provided by a properly trained individual under the supervision of a safety representative.
2. Used respirators will be cleaned and disinfected according to the manufacturer's recommendations and specifications.
3. Respirators will be issued to an individual user (to be used by only one person). If for some reason this requirement must be changed, the company safety representative will be consulted, and additional requirements may be stipulated to protect respirator users.
4. Fit tests will be conducted with the actual respirator that is to be used.
5. Respirators will be stored to protect them from damage, contamination, dust, extreme temperatures, excessive moisture, and chemicals. They will be stored in a manner that will prevent deformation of the face piece and exhalation valve.
6. Respirators that fail inspection will be removed from service and discarded or repaired.
  - a. Repairs will be made by the supplier and only after ensuring that the repair person has been qualified by the manufacturer to make the repairs
  - b. Repairs will be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed
  - c. Repairing and/or adjusting respirator valves, regulators or alarms will only be done by the manufacturer or a technician trained by the manufacturer

## **Change Schedules**

1. When available, filters, canisters, and cartridges will be purchased with an end-of-life indicator (ESLI) certified by NIOSH for the contaminant.
2. A changing schedule will be developed for each type of respirator used on the project that is not equipped with an end-of-service life indicator. Canisters, filters, and cartridges do not last forever. Therefore, we will utilize the manufacturer's specifications to establish the change schedule.



- 
3. Problems regarding change schedules will be referred to a company safety representative.

### **Cleaning Procedures**

Cleaning and disinfecting will be accomplished without damaging the respirator or causing harm to the user. The manufacturer's procedures will be followed. Reference OSHA 1926.134 (revised) Appendix titled "Respirator Cleaning Procedures (Mandatory)".

Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any other component recommended by the manufacturer. Discard or repair any defective parts.

Wash components in warm (43 degrees C or 110 degrees F, maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

Rinse components thoroughly in clean, warm running water and drain.

When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

- a. Hypochlorite solution (50ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 100 degrees F
- b. Aqueous solution of iodine (50ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine to one liter of water at 110 degrees F
- c. Other commercially available cleaners of equivalent disinfecting quality when used as directed, if their use is recommended or approved by the respirator manufacturer

Rinse components thoroughly in clean, warm water (110 degrees F, maximum) preferably in running water and drain. The importance of through rinsing cannot be overemphasized. Detergents and disinfectants that dry on face pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed



---

Components should be hand-dried with a clean lint-free cloth or be air-dried

Reassemble face piece, replacing filters, cartridges, and canisters where necessary

Test the respirator to ensure that components work properly

### **Fit Testing**

1. Respirators that rely on a mask-to-face seal will be annually checked with either qualitative or quantitative methods to determine whether the mask provides an acceptable fit to a wearer. Qualitative fit test procedures rely on subjective sensations such as taste, irritation, or smell generated by a particular testing agent. Quantitative fit tests rely on the use of instruments to measure face-seal leakage.
2. The relative workplace exposure level determines which fit test procedure to use:
  - a. For negative pressure, air-purifying respirators use either the qualitative (QLFT) or quantitative (QNFT) method provided the expected exposure level is less than 10 times the occupational exposure limit
  - b. For expected exposure levels 10 times the occupational exposure limit, utilize a quantitative fit test procedure
  - c. Fit testing for tight-face-seal atmosphere-supplying respirators and tight-fitting powered air-purifying respirators (PAPR), can be accomplished by either qualitative or quantitative fit testing methods in the negative pressure mode
3. The appropriate fit test will be conducted after obtaining medical authorization and before initial use or after a change in the face piece (size, type or make).
4. OSHA fit testing protocols will be utilized to conduct the appropriate fit test.
5. The QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less (calculated as stipulated in OSHA's Respiratory Protection Standard).
6. If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for a tight-fitting half face piece, or equal to or



greater than 500 for a tight-fitting full-face piece, then the QNFT has been passed with that respirator.

7. Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting PAPR respirators will be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that will be used to provide respiratory protection.
8. Qualitative fit testing will be accomplished by temporarily converting the user's face piece into a negative pressure respirator with appropriate filters or by using an identical negative pressure air-purifying respirator face piece with the same sealing surface as a surrogate for the atmosphere-supplying or PAPR respirator face piece.
9. Quantitative fit testing will be accomplished by modifying the face piece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement will be accomplished by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a means of sampling air inside the face piece.
10. Any modifications to the respirator face piece for fit testing will be completely removed and the face piece restored to NIOSH-approved configuration before the face piece can be used in the workplace.
11. Acceptable Fit-Testing Methods:

Respirator Type	QLFT	QNFT
Half-Face, Negative Pressure, APR (<100 fit factor)	Yes	Yes
Full-Face, Negative Pressure, APR (<100 fit factor) used in atmospheres up to 10 times the PEL	Yes	Yes
Full-Face, Negative Pressure, APR (>100 fit factor)	No	Yes
PAPR	Yes	Yes
Supplied Air Respirators (SAR) or (SCBA) used in negative pressure (demand mode) (>100 fit factor)	No	Yes



Supplied Air Respirators (SAR) or (SCBA) used in positive pressure (pressure-demand mode)	Yes	Yes
SCBA – Structural Fire Fighting, Positive Pressure	Yes	Yes
SCBA/SAR – IDLH, Positive Pressure	Yes	Yes
Mouth bit Respirators	Fit testing is not required	
Loose Fitting Respirators (hoods, helmets, etc.)	Fit testing is not required	

### Employee-owner Voluntary Use of a Respirator

AB&R safety representatives may provide respirators at the request of an employee-owner or permit employee-owners to use their own respirators once they have determined that such respirator use will not in itself create a hazard. If voluntary use of a respirator is allowed, we must provide the user with the following information:

- Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes workers may wear respirators to avoid exposure to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or you provide your respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.
- Read and heed the instructions provided by the manufacturer on use, maintenance, cleaning, care, and warnings regarding the respirator's limitations.
- Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Services certifies respirators. A label or statement of certification should appear on the respirator and/or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
- Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect. For example, a respirator designed to



---

filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.

- Keep track of your respirator so that you do not mistakenly use someone else's respirator.

### **Training Requirements**

1. Affected employee-owners will receive comprehensive, understandable training regarding this policy procedure and the OSHA standard.
2. The effectiveness of the training provided will be evaluated and documented (pre and post testing, observation, questioning during use in the field, etc).
3. The required training must take place before the employee-owner uses a respirator in the workplace.
4. Any employee-owner observed not conforming to program requirements will be re-trained to ensure compliance.

### **Recordkeeping**

For every employee-owner required to use a respirator, we must maintain medical evaluations, fit testing and training records for an indefinite period of time. Such records will be sent to the Corporate Safety Director's office when the project is complete.





## Austin Bridge & Road

### Respiratory Protection Policy and Procedure

#### Project Respirator Program Administrator (Respirator Competent Person)

(Project/Jobsite Name)

(Project/Jobsite Number)

(Project/Jobsite Location)

---

Administrator  
(Type in Name and Title)

---

Project Director/Manager/Superintendent  
(Type in Name and Title)

---

Company Safety Representative  
(Type in Name and Title)

---

Date



## **14. Lead In Construction**

### **Policy**

On projects where Austin Bridge & Road personnel may be exposed to lead at or above 30 ug/m<sup>3</sup> the provisions of this procedure will be implemented. Any job where there is possible lead exposure should be performed under the guidance of a Safety Professional and/or Industrial Hygienist.

### **Responsibilities**

#### ***Safety Director/Designee***

The Safety Director or designee is responsible for:

- Providing Environmental, Industrial Hygiene and Safety resources to site personnel relative to Lead and medical surveillance
- Providing training material on Lead Safety Requirements
- Maintaining occupational employee medical and exposure records

#### ***Safety Professional or Industrial Hygienist***

The Safety Professional or Industrial Hygienist should coordinate lead monitoring, PPE selection, employee-owner training, exposure results communications, work practice controls, medical surveillance, and recordkeeping for the project. All records generated will be stored electronically in HCSS.

#### ***Project Manager/Superintendent***

The Project Manager/Superintendent in coordination with the Safety Professional or Industrial Hygienist is responsible for:

- Determining if an assessment for lead is required for each job
- Verifying the management team for each job has appropriate training so that they understand when lead exposure determination and assessments are required.
- Implementing a “Lead Safety Execution Plan” for the job in consultation with the Safety Professional or Industrial Hygienist.



---

## **Foremen**

Foremen shall ensure that all aspects of the “Lead Safety Execution Plan” are implemented including work practice controls, PPE use employee-owner training, and personal hygiene.

### **Exposure Determination and Assessment**

- Air sampling will be conducted by or at the direction of a company industrial hygienist or safety representative to accurately determine the employee-owners exposure level to lead as required.
- This policy/procedure applies to construction and demolition operations that may involve the use and/or handling of lead.
- Supervisors or safety representatives must determine if any project can generate lead exposures at or above the lead action level concentration of 30 micrograms per cubic meter of air (30ug/m<sup>3</sup>) calculated on an 8-hour time-weighted average (TWA) without regard to the protection provided by the use of a respirator. Affected employee-owners will be allowed an opportunity to observe any monitoring of exposures to lead. Affected employee-owners will be allowed to:
  - Receive an explanation of the measurement procedure.
  - Be allowed to observe the steps related to the monitoring of lead at the place of exposure.
  - Receive a copy of the laboratory results for their exposure measurements.
- Supervision must ensure that no employee-owner is exposed to lead at greater concentrations than 50 micrograms per cubic meter of air (OSHA's Permissible Exposure Level [PEL] 50ug/m<sup>3</sup>) averaged over an 8-hour period (TWA).
- Where lead coatings or paint is present and manual demolition of structures (drywall), manual scraping, manual sanding, heat gun applications, power tool cleaning with dust collection systems, spray painting with lead paint is performed, or an employee-owner may be exposed more than the PEL. The following conditions require lead exposure assessments: lead coating or paint until we assess and document the actual exposure level, we will assume that exposure is



---

above the PEL. Supervision will provide the appropriate protective measures listed in this procedure.

- When using lead-containing mortar, performing lead burning where lead-containing coatings or paint is present, rivet busting, power tool cleaning without a dust collection system, cleanup where dry expendable abrasives are used and abrasive blasting enclosure movement and removal are taking place, and until exposure assessments have been completed and the results documented, it will be assumed that exposures above the PEL up to 500 ug/m<sup>3</sup> have occurred. Supervision will provide appropriate protective measures listed in this procedure.
- When abrasive blasting, welding, cutting, and torch burning is required and until the required exposure assessment is completed and documented, it will be assumed that exposure levels exceed the PEL and supervision will provide the appropriate protective measures listed in this procedure.

### **Personal Protective Equipment (PPE)**

Personnel exposed to lead and performing work tasks listed in items 8, 9, and 10 in the Exposure Assessment and Determination section of this procedure (above), will use the following PPE (see specific requirements in this procedure for each item listed) until actual exposure determination has been completed:

- Appropriate respiratory protection (see specific requirements contained in this procedure). Respirator use requires compliance with the Respiratory Protection Section of this manual
- Appropriate protective clothing and equipment
- Change areas
- Hand washing facilities
- Biological monitoring (consisting of blood sampling and analysis for lead and zinc protoporphyrin levels)
- Training:
  - Lead training



- 
- Hazard communication
  - Respirator use
  - Other applicable safety training to the task to be performed

### **Initial Lead Exposure Determination**

- Supervision will monitor each employee-owner exposed to airborne concentrations of lead to obtain a base initial exposure determination for lead operations. OSHA makes some restricted allowances for not completing the baseline lead exposure assessment. However, a Company safety representative will have to be consulted and will have to approve any lead operation not requiring lead exposure assessment(s).
- Supervisors must take into consideration any information, observations, or calculations that would indicate an employee-owner had been exposed to lead before making job assignments. Previous measurements of airborne lead and employee-owner complaints or symptoms may be attributable to lead exposure. Any of these events must be reported to the safety representative and may require further testing.
- Monitoring for the initial determination may be limited to a representative sample for an employee-owner exposed to the greatest airborne concentrations of lead in the workplace.
- Exposure monitoring records and documentation must be maintained that describes the nature and relevancy of objective data used in assessing employee-owner lead exposures in lieu of exposure monitoring.
- Negative initial determinations will be properly documented and will include the date of determination, location within the worksite, and the name and social security number of each employee-owner monitored.

### **Lead Exposure Monitoring**

1. When exposure monitoring demonstrates the possibility for employee-owner lead exposure levels to be at or above the action level, monitoring for exposed



---

employee-owners in the workplace will be conducted under the supervision of a company safety representative.

2. If the initial determination or subsequent determination reveals employee-owner exposure to be at or above the action level but at or below the PEL, monitoring will be performed at least every 6 months. Monitoring will continue at the 6-month frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level. At this time, monitoring for that employee-owner may be discontinued.
3. If the initial determination reveals that an employee-owner's exposure is above the PEL quarterly monitoring will be required. Quarterly monitoring will continue until at least two consecutive measurements, taken at least 7 days apart, are at or below the PEL but at or above the action level. Repeat monitoring will be required on a 6-month basis. Monitoring will continue at the 6-month frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time we may discontinue monitoring for that employee-owner except as provided in the following requirement.
4. Additional exposure assessments are required whenever there has been a change of equipment, process, control, or personnel or a new task has been initiated that may result in additional employee-owners being exposed to lead at or above the action level or may result in employee-owners already exposed at or above the action level being exposed above the PEL.
5. We must use a monitoring method that is accurate to a confidence level of 95% of not less than a plus or minus 25% for airborne concentrations of lead equal to or greater than 30 ug/m<sup>3</sup>.

### **Employee-owner Notification**

1. Within 5 working days after completion of the exposure assessment, a human resources or safety representative is required by OSHA standards to notify each employee-owner in writing of their exposure results.
2. Whenever the monitoring results indicate that the employee-owner's exposure (without regard to respirator use), is at or above the PEL, a human resources or



---

safety representative will include in the written notice a statement that the exposure was at or above the OSHA PEL and a description of the corrective action taken (or to be taken) to reduce exposure to below the PEL.

### **Lead Exposure Controls**

1. The supervisor will implement and maintain work practice controls to include both engineering and administrative to reduce employee-owner's exposure to lead below the PEL to the extent feasible.
2. Whenever engineering and administrative controls cannot reduce employee-owner's exposures below the PEL by themselves and/or in combination, personal protective equipment such as respirator use will be required to augment the work practice controls.
3. Each project involving potential lead exposure will have a Lead Safety Execution Plan completed to address site-specific requirements outlined in this procedure and other applicable procedures such as personal protective equipment and respiratory protection. The required Job Safety Execution Plan will include at least:
  - a. A description of each activity in which lead is emitted (to include equipment used, materials involved, controls, crew size, employee-owner's job assignments, and operating procedures and maintenance practices)
  - b. A description of the specific means that will be used to achieve compliance with the applicable requirements specified in this manual
  - c. Engineering plans or studies used to determine methods selected for controlling lead exposures will also be included and/or attached
  - d. Analysis of the technology considered in meeting the OSHA PEL
  - e. Air monitoring data which documents the source of lead emissions
  - f. A detailed schedule for implementation of the site-specific program including documentation such as copies of purchase orders for equipment, contracts, etc.



- 
- g. A description of the site-specific work practice program
  - h. Provisions for frequent and regular competent person inspections of the job site, tools, equipment, and materials
  - i. An administrative control schedule if applicable
  - j. A description of arrangements made among contractors on multi-contractor sites with respect to informing affected personnel of the potential exposure to lead and responsibility for compliance with OSHA standards.
  - k. The site-specific Safety Execution Plan will be reviewed and revised at least every 6 months to reflect the status of the control program.
4. If a mechanical ventilation system is used to control lead exposure either the supervisor or safety representative to ensure proper operation must monitor it.
  5. If administrative control(s) are used as a means of reducing employee-owner TWA exposure to lead, the required job rotation schedule will include:
    - a. Name and/or ID number of each affected employee-owner
    - b. Duration and exposure levels at each job or work assignment where each affected employee-owner is located
    - c. Other useful information in assessing the reliability of the administrative controls to reduce lead exposures (such as air monitoring results)

### **Respiratory Protection**

1. Respirators must be utilized when an employee-owner's exposure level to lead has the potential to exceed the PEL. This includes during the time that the initial exposure monitoring is completed and until exposure levels can be determined.
2. Employee-owners who wish to utilize a respirator will be allowed to do so regardless of the lead exposure level.
3. Respirator use will comply with the Respiratory Protection Program contained in this manual.
4. We must supply PAPR when an employee-owner chooses.





5. Respirators selected will comply with the following:

Airborne Concentration of Lead or Condition of Use	Required Respirator
Not in excess of 500-ug/m <sup>3</sup>	Half mask air- purifying respirator equipped with high efficiency filters or half mask supplied air respirator operated in the demand (negative pressure) mode.
Not in excess of 1,250 ug/m <sup>3</sup>	Loose fitting hood or helmet powered air purifying with high efficiency filters. Hood or helmet supplied air respirator operated in the continuous flow mode.
Not in excess of 2,500 ug/m <sup>3</sup>	Full face piece air purifying respirator equipped with high efficiency filters; or tight-fitting powered air purifying respirator with high efficiency filters; or full-face piece supplied air respirator operated in the demand mode; or  Half mask or full-face piece supplied air respirator operated in continuous flow mode; or full-face piece SCBA operated in demand mode.
Not in excess of 50,000-ug/m <sup>3</sup>	Half mask supplied air respirator operated in pressure demand or other positive pressure mode.
Not in excess of 100,000-ug/m <sup>3</sup>	Full-face piece supplied air respirator operated in pressure demand or other positive-pressure mode e.g. type CE abrasive blasting respirators operated in a positive pressure mode.
Greater than 100,000 ug/m <sup>3</sup> or Unknown	Full-face piece SCBA operated in pressure-demand or other positive pressure mode.



---

Note: Respirators specified for higher concentrations of lead can be used for lower concentrations.

Full-face piece respirators are required if the lead aerosols cause eye or skin irritation at the use concentration.

High-efficiency filter: means a filter that is 99.97% efficient against particles of 0.3-micron size or larger.

### **Protective Work Clothing and Equipment**

1. When employee-owners are exposed to lead above the PEL (without regard to respirator use), when lead compounds that may cause skin or eye irritation (lead arsenate and lead azide), or when performing tasks described in items 8, 9, and 10 of the Exposure Assessment and Determination section of this procedure, the supervisor will provide protective clothing at no cost to the employee-owner. Such garments will protect the employee-owner from contaminating his/her regular clothing. Examples include but are not limited to:
  - a. Coveralls and similar full-body work clothing
  - b. Gloves, hats, and shoes or disposable covers
  - c. Face shields, vented goggles, or other appropriate protective equipment meeting the standards specified by OSHA and contained in this manual
2. Project supervision will provide protective clothing in a clean and dry condition at least weekly and daily for employee-owners whose exposure levels (without regard to respirator use) are over 200 ug/m<sup>3</sup> of lead as an 8-hour TWA. The supervisor will provide for the cleaning, laundering, and/or disposal of protective clothing and equipment.
3. Project supervision will repair or replace the required protective clothing and equipment as needed to maintain their effectiveness.
4. Project supervision will ensure that protective clothing is removed after the work shift in designated change areas provided for that exclusive purpose.
5. Project supervision will ensure that contaminated protective clothing that is to be cleaned, laundered, or discarded is placed into a closed container in the



---

designated change area. This will prevent the dispersion of lead outside the container.

6. Project supervision must inform the laundry or anyone who cleans lead-contaminated equipment (in writing) of the potential harmful effects of exposure to lead.
7. Containers for lead-contaminated protective clothing must be labeled as follows:
  - a. "Caution: Clothing contaminated with lead. Do not remove dust by blowing or shaking. Dispose of lead-contaminated wash water in accordance with applicable local, state, or federal regulations".
8. Project supervision will enforce the above "caution" at the job site.

### **Housekeeping**

1. Maintain surfaces as free of lead accumulations as practicable.
2. Whenever possible, lead accumulations will be cleaned by vacuuming or other methods that minimize the likelihood of lead becoming airborne.
3. Shoveling, dry or wet sweeping, and brushing may only be used when vacuuming and other methods have been tried and found not to be effective.
4. Vacuums will be equipped with HEPA filters and emptied in a manner that minimizes the reentry of lead into the workplace.
5. Compressed air will not be used to remove lead from any surface unless the compressed air is used in conjunction with a ventilation system designed to capture the airborne dust created by the compressed air.

### **Hygiene Facilities and Practices**

1. Eating or drinking, storage of food and beverages, use of tobacco products, and application of cosmetics will not be allowed in areas where lead contamination could occur above the OSHA PEL (without regard to the use of a respirator) or before washing their hands and face to remove any potential lead contamination.
2. Change areas will be provided for employee-owners whose airborne exposure to lead is above the PEL and as interim protection for personnel performing tasks



---

as specified in items 8, 9, and 10 of the Exposure Determination and Assessment section of this procedure, without regard to the use of a respirator.

3. Change areas will be separated and arranged so that street clothes and protective work clothing do not become cross-contaminated.
4. Employee-owners will not leave the workplace or visit designated eating areas in any clothing that could be lead-contaminated.
5. Showers will be provided (where feasible) for employee-owners exposed to lead above the PEL.
6. An adequate supply of cleaning agents and towels will be provided in the shower facility.
7. Lunchroom facilities or eating areas will be provided for employee-owners that are free as practicable from lead contamination and readily accessible.
8. Whenever showers cannot be provided, washing facilities will be provided and employee-owners will be required to wash their hands and face before eating, drinking, using tobacco products, and applying cosmetics and/or at the end of the work-shift.

### **Medical Surveillance**

1. Lead medical surveillance will be carried out under the direction of a licensed physician.
2. The surveillance program will be carried out at no cost to the employee-owner (including multiple physician review when required).
3. Biological monitoring will be initiated for employee owner's exposure and these evaluations will test for blood lead and zinc protoporphyrin (ZPP) levels according to the following schedule:
  - a. Employee-owner(s) working with lead that may be exposed at or above the action level at any time during the project will receive initial blood lead level testing to ensure that such exposure does not add to an existing condition and to provide a base line for future comparison



- 
- b. Every employee-owner exposed at or above the action level for more than 30 days in any consecutive 12-month period must be tested at least every 2 months for the first 6 months and every 6 months thereafter
  - c. Any employee-owner whose last blood analysis indicated a blood lead level at or above 40 ug/dl, at least every 2 months and will continue until 2 consecutive blood samples indicate a blood lead level below 40 ug/dl
  - d. Each employee-owner who is removed from exposure to lead due to an elevated level will receive testing at least monthly during the removal period
  - e. Every employee-owner who has blood lead levels at or above the action level and subsequent testing indicates that the employee-owners blood lead level is at or above 50 ug/dl will receive follow-up blood tests within two weeks after receipt of the first lead blood sampling test results
4. Laboratory analysis will have accuracy (to a confidence level of 95%) within plus or minus 15% or 6 ug/dl; whichever is greater, and conducted by a laboratory approved by OSHA.
  5. Within 5 working days after receipt of the laboratory results, the affected employee-owner(s) will be notified in writing of his/her blood lead level.
  6. Employee-owners who have a blood lead level exceeding 40 ug/dl will be notified that the OSHA standard requires temporary medical removal with medical removal protection benefits when the blood lead level exceeds the action level and the required follow-up testing indicates that the blood lead level is at or above 50 ug/dl.
  7. Medical examinations and consultations will be made available for any employee-owner who may be exposed to the lead action level as a result of work assignments. Employee-owners exposed at or above the action level for more than 30 days in any consecutive 12 months will receive medical examination and consultation according to the following schedule:



- 
- a. At least annually for each employee-owner for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 ug/dl
  - b. As soon as possible when notified by an employee-owner that signs and/or symptoms commonly associated with lead intoxication are evidenced
  - c. As soon as possible when an employee-owner desires medical advice concerning the effects of current or past lead exposure(s) regarding the ability to procreate a healthy child, that the employee-owner is pregnant and/or having difficulty breathing during a respirator fit test or use;
  - d. As medically appropriate for each employee-owner either removed from exposure to lead due to a risk of sustaining material impairment to health or otherwise limited under a final medical determination
- 8.** The physician conducting the examination will determine the content of the medical evaluations for employee-owners with signs or symptoms of lead intoxication and evaluations based on removal from lead exposure because of a risk of sustaining material impairment.
- 9.** If requested by an employee-owner, the examination can include pregnancy testing or laboratory evaluation of male fertility.
- 10.** Annual medical evaluations conducted for employee-owners whose blood tests during the preceding 12 months indicated a level at or above 40 ug/dl, will have annual medical evaluations consisting of:
- a. A detailed work and medical history with particular attention to past lead exposure (occupational and non-occupational), personal habits such as smoking and personal hygiene, and past gastrointestinal, hematologic, renal, cardiovascular, reproductive, and neurological problems
  - b. A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be included if respiratory protection is used



- 
- c. A blood pressure measurement
  - d. A blood sample analysis that determines the blood lead level, hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology
  - e. Zinc protoporphyrin
  - f. Blood urea nitrogen
  - g. Serum creatinine
  - h. Routine urinalysis with microscopic examination
  - i. Laboratory or other test relevant to lead exposure that the examining physician deems necessary by sound medical practice.
- 11.** The employee-owner may designate a second physician to review findings, determinations, or recommendations of the initial physician and to conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate the review.
- 12.** Human Resources or safety representative will notify the employee-owner of the right to seek a second opinion after the initial examination or consultation. The participation in and payment for a secondary evaluation is conditioned on the employee-owner notifying his/her supervisor within 15 days of receipt of the foregoing notification or receipt of the initial physician's written opinion, or whichever is later: the employee-owner informing a company representative of the intent to seek a second opinion and the employee-owner's initiating steps to make an appointment with a second physician.
- 13.** If the findings, determinations, and/or recommendations are different from the first physician, the affected employee-owner and safety representative must initiate steps for the two physicians to resolve any disagreement.
- 14.** If a disagreement between the first and second physicians cannot be quickly resolved, then the employee-owner and company safety representative have a third physician designated through their respective physicians. The third physician will review any findings, determinations, or recommendations of the



---

prior physicians and conduct such examinations, consultations, laboratory tests, and discussions with the prior physicians as deemed necessary by the third physician to resolve the disagreement.

15. We will act consistent with the findings, determinations, and recommendations of the third physician unless we reach an agreement with the employee-owner that is consistent with the recommendations of at least one of the three physicians.
16. The consulting physician(s) will be provided a copy of the OSHA Lead Standard, including appendices, a description of the work assignments related to lead exposure, the known or anticipated lead exposure level and/or any other toxic substance, a description of the required personal protective equipment, prior blood lead determinations and written prior medical opinions.
17. The affected employee-owner(s) will be provided a copy of any medical opinion whether there are positive or negative medical findings. This information will include detected medical conditions, limitations and/or special provisions, and the results of blood lead level testing.
18. We must instruct the examining physician to not reveal any medical condition (neither orally nor in writing) not related to the employee/owner's exposure to lead. The physician will advise the employee-owner of any medical condition, both occupational and non-occupational, which dictates further medical examination or treatment.
19. The employee-owner can select an alternative physician determination method in place of the multiple physician review as long as the alternative method is expeditious and protective as the criterion contained in the multiple physician review.

### **Chelation**

- Employee-owners will not be allowed to engage in prophylactic chelation at any time.
- If therapeutic or diagnostic chelation is to be performed, it must be administered under the supervision of a licensed physician in a clinical setting with thorough





---

and appropriate medical monitoring. The employee-owner(s) must be notified in writing before the initiation of chelation therapy.

### **Medical Removal Protection**

- Temporary Removal Due to Elevated Blood Lead Level: Employee-owners having exposure to lead at or above the action level and when blood lead level determinations are required as described in this procedure and when the blood lead level is at or above 50 ug/dl will be temporarily removed from lead exposure activities.
- Temporary Medical Removal Due to a Final Medical Determination: Employee-owners having an exposure at or above the action level and on each occasion that a final medical determination results in a finding or opinion that the person has a detected medical condition which places that person at increased risk of material impairment to health from exposure to lead.

The phrase "final medical determination" means a written medical opinion on the employee-owner's health status by an examining physician (including multiple physicians' reviews). Physician recommendations and limitations regarding lead exposure will be complied with.

- Return of an Employee-owner to Former Job Status:
- For an employee-owner removed due to a blood lead level at or above 50 ug/dl when two consecutive blood sampling tests indicate that the employee/owner's blood lead level is at or below 40 ug/dl.
- For an employee-owner removed due to final medical determination, when a subsequent final medical determination results in a medical finding or determination that the employee-owner no longer has a detected medical condition which places the person at increased risk of material impairment to health from lead exposure
- For an employee-owner removed for special protective measures and/or limitations, such protection will be removed when a subsequent medical determination indicates that the protective measures and/or limitations are no longer needed.



- 
- When a final determination has not been reached during the multiple physician review mechanism or alternative medical determination mechanism, we can remove the employee-owner from lead exposures, provide special protective measures or place limitations on the employee-owner consistent with the medical findings of any of the physicians who have reviewed the employee/owner's health status.
  - The employee-owner may be returned to their former job status, end any special protective measures, and remove any limitations consistent with the medical findings and determinations of any of the physicians who have reviewed the employee-owner's health status, with two exceptions:
  - If the initial removal, special protection, or limitation resulted from a final medical determination that differed from the findings, determinations, or recommendations of the initial physician
  - If the employee-owner has been on removal status for the preceding 18 months due to an elevated blood lead level, then we must wait for a final medical determination

### **Medical Removal Protection Benefits**

- Austin Bridge & Road must provide up to 18 months of medical removal protection benefits on each occasion that an employee-owner is removed from lead exposure or otherwise limited as a result of occupational lead exposure and when he/she sustains a reduction in pay or benefits as a result of removal.
- The benefits include the normal earnings, seniority, and other employment rights and benefits including the right to his/her former job status as though the employee-owner had not been medically removed or limited.
- Removal protection benefits can be conditioned upon the employee-owner's participation in follow-up medical surveillance.
- We will continue to provide medical removal benefits pending disposition of any workers' compensation claim. To the extent that an award is made to the employee-owner for earnings lost during the period of removal, the employee-



---

owner's medical removal protection obligation can be reduced by such an amount (this does not apply to the medical expenses incurred).

- Austin Bridge & Road can utilize other credits if the employee-owner derives benefits or compensation for the earnings lost during the period of removal from publicly or Company funded compensation program or receives income from employment with another employer made possible by the employee-owners removal.
- When the company voluntarily removes limits or restricts an employee-owner as a result of lead exposure, they will provide full medical removal benefits if the employee-owner experiences a reduction to normal pay or benefits as a result of removal.

### **Employee-owner Information and Training**

- Employee-owners subject to lead exposure will receive training prior to initial job assignment and at least annually thereafter.
- Training will contain the following:
  - The content of the OSHA Lead Standard
  - Specific nature of the operations that could result in exposure to lead at or above the action level
  - The purpose, proper selection, fitting, use, and limitations of respirators
  - The purpose and description of the medical surveillance program
  - The medical removal process
  - Adverse effects associated with excessive exposure to lead including reproductive effects and hazards to the fetus of pregnant females
  - The engineering controls and work practices associated with lead work assignments
  - The contents and requirements of any specific site plan in effect



- 
- Instructions that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all unless under the direction of a licensed physician
  - The employee-owner's right to access medical records

### **Signs**

- No sign will be posted in the area of the lead warning sign, which contradicts or detracts from the meaning of the required sign.
- Warning signs will be posted that contain the following information at all entrances to areas where exposures to lead are expected to exceed the OSHA Lead PEL:

**WARNING**

**LEAD WORK AREA**

**POISON**

**NO SMOKING OR EATING**

- The lead warning signs will be illuminated and cleaned as necessary so that the legend is readily visible.

### **Recordkeeping**

- Records for monitoring and other data used in conducting employee-owner exposure assessments will be established and maintained following OSHA regulations and this standard.
- Exposure monitoring records will include:
- The dates, number, duration, location, and results of each of the samples taken if any, including a description of the sampling procedures used to determine representative employee-owner's exposure
- A description of the sampling and analytical methods used and evidence of their accuracy
- Types of respiratory devices utilized



- 
- Name, social security number, and job classification of the employee-owners monitored and others whose exposure measurement is intended to represent
  - The environmental variables that could affect the measurement of employee-owners exposure.
  - Medical surveillance records will be maintained as follows:
  - Medical records will be maintained for each employee-owner subject to medical surveillance
  - The record will include the name, social security number, and description of the duties of the employee-owner
  - A copy of the written physician's opinions
  - Results of airborne exposure monitoring
  - Medical complaints related to exposure to lead
  - Monitoring records will be maintained following Company policy and OSHA standards.
  - We will keep or ensure that the physician keeps the following medical information:
  - A copy of the medical examination results, including medical and work history
  - A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information
  - A copy of the biological monitoring results
  - Medical removal records:
  - A separate record will be established and maintained for each employee-owner removed from current exposure to lead
  - Each record will include the name, social security number, the date of each occasion that the employee-owner was removed from current exposure as well as the corresponding return to regular duties or job status
  - A brief explanation of how each removal was or is being accomplished



- 
- A statement for each removal indicating whether or not the reason for the removal was an elevated blood lead level
  - The medical removal records will be maintained for at least the duration of the employee-owner's employment

### **Objective Data for the Exemption from the Requirement for Initial Monitoring**

- Objective data is that information verifies that a product or material containing lead cannot release dust or fumes in concentrations at or above the action level under any expected conditions of use.
- Industry-wide study or laboratory test results from manufacturers of lead-containing products or materials.
- The data obtained must relate to the workplace conditions, operations, processes, type of material used, control methods, work practices, and environmental conditions.
- Records of the objective data will be maintained for at least 30 years.
- This information will be available for employee-owner access upon request.

### **Record Transfer**

Records may be maintained at the site until project completion or be maintained at the home office only. Records will eventually be maintained and stored at the home office.



---

## 15. First Aid and Bloodborne Pathogens

### General Requirements

1. This procedure is designed to outline the precautions and requirements necessary to prevent bloodborne infections in the execution of work-related or first-aid tasks. Examples include Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV).
2. This procedure applies to contractor and subcontractor personnel who may have the potential for occupational exposure to blood or body fluids, either through first aid and emergency treatment or from handling waste materials.
3. In addition to training first aid attendants and establishing emergency transport and medical care before project startup, the senior site supervisor will consult with a company safety representative to implement the controls outlined in this procedure.

### Exposure Control Practices

1. General
  - An employee-owner in a position that may require occupational exposure to bloodborne pathogens will receive training and education relating to bloodborne disease, especially HIV and HBV at the time of initial assignment and annually thereafter
  - Training will include a review and discussion of this procedure and the contents of the OSHA Bloodborne Pathogen standard
2. Documentation
  - Training of employee-owners including supervisors will be documented
  - It is the responsibility of the safety director or his designee to maintain the training records electronically within HCSS.
3. Verification/Validation
  - Training of employee-owners (including supervisors) must be verified/validated to ensure understanding of the training content



- 
- Verification and validation of the training may be in the form of quizzes, written or oral tests and/or work practice evaluation

### **First Aid**

1. Trained providers will administer first aid. Provisions for ensuring that an adequate number of trained first aid providers will be assigned to a project is the responsibility of project management in consultation with a company safety representative.
2. The designated first aid provider will hold a current training certificate from an approved provider such as the American Red Cross. Approved first aid courses will include blood-borne pathogen issues. Documentation of the training will be available at the project for review

### **Construction Operations and the Potential Exposure to Bloodborne Pathogens**

Employee-owners in the following job classifications have been identified as potential workers at risk. These job classifications include:

1. First Aid Attendants
2. Foremen
3. Laborers who clean up offices and restroom facilities
4. Janitors
5. Medics
6. Nurses
7. Safety, Health, and Environmental Representatives
8. Personnel collecting urine samples for drug testing
9. Trash Haulers

### **Personal Protective Equipment (PPE)**

1. Employee-owners trained in first aid will be provided with and required to use appropriate PPE.





2. The following table will be utilized when performing a PPE Assessment for personnel exposed to bloodborne pathogens:

**Personal Protection Usage Guide**

Task	Required PPE		
	Gloves	Mask	Eye Protection
When attending to:			
Uncontrolled Bleeding	Y	Y	Y
Bleeding - Minimal	Y	N	N
Resuscitation	Y	**	N
Cleaning Blood or Body Fluids	Y	N	Y
Dressing Changes	Y	N	N
Eye Irrigation	Y	N	N
Housekeeping Duties	Y	N	Y
Water Closet Cleaning	Y	N	Y
Collecting Urine Samples	Y	N	Y

\*\*Airways, facemasks, and/or mechanical respiratory devices required. Employee-owners using this equipment must be appropriately trained.

**Laborers and Janitors**

1. When laborers and/or janitors perform housekeeping duties, it is required that they wear as a minimum, gloves and safety glasses to protect themselves from possible exposure to bloodborne pathogens in urine and/or feminine hygiene products.
2. First aid facilities and bathrooms will be cleaned as per universal precautions listed in Appendix A.

**Medical Waste Collection and Disposal**

1. Medical Waste is defined as blood, body fluids, used bandages, and any material, which has been in contact with blood or other bodily fluids.
2. Labels



- 
- Labels must be placed on containers of medical waste
  - Labels must be fluorescent orange or orange-red with lettering and/or biohazard symbol in a contrasting color

### 3. Approved Containers and Plastic Bags

- An approved disposal container must be a closeable, leak-proof container with a minimum capacity of five gallons. The container will have the required biohazard warning label. Containers will be lined with a plastic bag.
- Plastic bags used for medical waste will have the required label either as an integral part of the bag or affixed to the bag by methods that prevent their unintentional removal or loss.

### 4. Collection

- Job sites must collect medical waste in an approved waste disposal container lined with an approved plastic bag.
  - i) Plastic bags may not be removed from metal containers until it is transferred to the disposal facilities established by the company safety representative.
  - ii) A "Chain of Custody Form" (see attached) must be used to document the transfer of the plastic bag from the job site to the central collection location or disposal facility. The appropriate designated person will sign the form.
- Personnel will not collect medical waste material unless trained in accordance with this procedure, utilizing the proper PPE and protective methods, and having received/rejected the Hepatitis B Vaccine.

### **Exposure Incidents**

If exposure to blood and/or body fluids should occur, the incident must be reported immediately to the job site management. The steps outlined in Appendix B must be followed.



---

## **Hepatitis B Vaccination**

We must make available, free of charge and at a reasonable time and place, the hepatitis B vaccine and vaccination series to all employee-owners who are at risk of occupational exposure (see first page of procedure, Potential for Exposure, Job Classifications). Any booster doses recommended by the attending physician will be provided.

We must offer free hepatitis B vaccine and vaccination series after initial training and within 10 working days of initial assignment unless (1) the employee/owner has previously received the complete hepatitis B vaccination series, (2) antibody testing reveals that the employee-owner is immune, or (3) medical reasons as determined by the attending physician prevents the employee-owner from being vaccinated.

The employee-owner cannot be required to participate in an antibody-prescreening program to receive the hepatitis b vaccination series. However, refusal to participate should be in consultation with a physician who can properly review the risk/benefit with the affected employee-owner. All medical evaluations and procedures will be performed by or under the supervision of a licensed physician or an appropriately trained and licensed health care provider and administered according to current recommendations of the US Public Health Service. Vaccinations will be provided even if the employee/owner initially declines but later accepts treatment. Employee-owners who decline the vaccination must sign a declination form (see attached form).



---

# Austin Bridge & Road Exposure to Blood and/or Body Fluids

## Appendix A: Bloodborne Pathogens Exposure Control

Exposure means contact with blood, blood products, and/or other infectious body fluids, through percutaneous injection (such as needle sticks), contact with open wounds, non-intact skin, or mucous membranes.

If employee-owner exposure occurs, the following steps are required:

1. The exposed person must immediately and thoroughly clean his/her exposed body part and/or spill area with soap and water and disinfectant as appropriate. The exposed employer-owner is required to immediately notify his/her supervisor as soon as possible after cleaning, washing, and flushing has been completed to remove contaminated material from their body.
2. The appropriate company physician must be contacted and the employee-owner referred to as soon as possible for evaluation and/or treatment.
3. The job site supervisor is responsible for getting prompt medical attention for the exposed employee-owner and for notifying the appropriate safety representative of the occurrence.
4. An investigation report containing at least the following information must be filed with your safety representative (this report is to be handled as confidential information):
  - Name of exposed person - job classification -project contract number
  - Route of exposure
  - Circumstances under which the exposure occurred
  - Identifications of the source individual
5. At the direction of the attending physician, the exposed employee-owner will be tested to establish a serological baseline. The employee-owner must give consent and the consent must be documented.



At the direction of the attending physician, the source individual will be informed of the incident and after his/her consent is obtained and documented, tested for serological evidence of HIV and/or HBV.

**SOME PHYSICIANS CURRENTLY ADMINISTER BLOODBORNE PATHOGEN EXPOSURE THERAPY THAT IS EXTREMELY TIME-SENSITIVE. IT IS IMPERATIVE TO HAVE EXPOSED EMPLOYEE-OWNERS EVALUATED AS SOON AS POSSIBLE AFTER THE EXPOSURE TAKES PLACE.**

**PROJECT  
MEDICAL WASTE  
CHAIN OF CUSTODY**

**6. TRANSPORTING FACILITY**

Project Name \_\_\_\_\_

Location \_\_\_\_\_

Person transporting material: \_\_\_\_\_

How much waste is being transported? \_\_\_\_\_ Bags  
\_\_\_\_\_ Other

What facility did you transport the waste to? \_\_\_\_\_

What is the condition of the waste? \_\_\_\_\_ Good  
\_\_\_\_\_ Bad

Truck No. \_\_\_\_\_ License \_\_\_\_\_

Time delivered \_\_\_\_\_

**7. RECEIVING FACILITY**

Location \_\_\_\_\_ Time Received \_\_\_\_\_

What is the condition of waste? \_\_\_\_\_ Good  
\_\_\_\_\_ Bad

How much was transported? \_\_\_\_\_ Bags  
\_\_\_\_\_ Other

Was waste properly labeled and transported?  Y  N



\_\_\_\_\_  
Transporting Personnel (print)

\_\_\_\_\_  
Receiving Personnel (print)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature



---

**Austin Bridge & Road**

**HEPATITIS B WAIVER FORM**

To protect our employee-owners from exposure to bloodborne pathogens, we have developed a company safety policy in compliance with the OSHA Bloodborne Pathogen Standard. In compliance with the Company Safety Policy, we offer free Hepatitis B vaccinations to any employee-owner who may be exposed to blood or body fluids as a result of Company related work assignments and job duties.

The OSHA standard requires all exposed employee-owners who refuse the vaccination, to sign a waiver indicating that the risk of refusing the vaccine has been explained to them. The following statement is directly quoted from the OSHA standard and must be appropriately executed:

" I \_\_\_\_\_, understand that due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with the hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining the vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me."

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



---

## 16. Hearing Conservation

### General Requirements

1. This procedure is designed to reduce employee-owners occupational hearing loss through the implementation of a hearing conservation program described in this section of the manual.
2. Our Hearing Conservation Program covers work locations whenever noise exposure to employee-owners equals or exceeds an 8-hour time-weighted average (TWA) of 85 decibels at plant sites, equipment maintenance shops, and storage yards not located on construction sites and 85 decibels for work activities at construction sites.
3. The assigned company safety representative will perform the duties of program administrator for the hearing conservation program. His/her duties include:
  - Identify hazardous noise areas and high noise exposure jobs or tasks
  - Monitor job classifications to determine noise exposure levels. The results of this monitoring will be used to determine which job classifications must be included in the hearing conservation program.
  - Provide opportunities for affected employee-owners to observe the monitoring/measurement process and to ask questions
  - Ensure notification of the affected employee-owner(s) of the monitoring results
  - Make hearing protection available
  - Train employee-owners at least annually
  - Arrange for and maintain records for audiometric testing when an employee-owner exceeds a TWA of 85 decibels for non-construction site exposures and construction site exposures

### Controls

1. Whenever employee-owners must work in areas or with equipment and tools that expose them to noise levels exceeding the permissible exposure levels, feasible





---

administrative and/or engineering controls will be used to reduce noise levels. If such controls fail to reduce the noise levels, personal hearing protective equipment will be utilized to reduce their exposure to noise levels below the PEL.

2. Administrative controls, such as work rotation, can be used to reduce the noise exposure of an individual if engineering controls and hearing protective devices cannot reduce the noise levels within the levels listed in the tables included herein.

### **Monitoring:**

1. When information indicates that an employee-owner's exposure may equal or exceed an 8-hour TWA, a monitoring program will be implemented.
2. Area monitoring may be conducted with a sound level meter having an "A" scale (slow response). Where high worker mobility or a significant variation in sound levels exists, representative personal sampling will be conducted using a personal sampling device.
3. Monitoring will be repeated whenever a change in site, process, equipment, or controls increases noise exposure.
4. Instruments used to measure employee-owner noise exposure will be calibrated to ensure the accuracy of the measurement.

### **Training**

1. Employee-owners who are exposed to noise at or above the 8-hour TWA-PEL will be given training that covers the following topics:
  - a. The effects of noise on hearing
  - b. The purpose of hearing protectors, advantages, disadvantages, and attenuation of various types
  - c. Instructions on selection, fitting, use, and care of hearing protection
  - d. The purpose of audiometric testing and an explanation of the testing procedures



- 
2. The training will be conducted at least annually for each employee-owner. Information provided during the training will be updated to remain consistent with changes in protective equipment and work processes.
  3. Affected employee-owners will have access to the OSHA standards and a copy of this procedure will be posted at job locations where it is implemented.

### **Audiometric Testing**

1. Employee-owners who may exceed the OSHA PEL for noise exposure will participate in a baseline-testing program and annual audiometric testing thereafter.
2. A supervising physician will be selected who will be provided with the following information:
  - A copy of the OSHA standard
  - Prior audiometric testing that has been completed on the affected employee/owner(s)
  - Measurements of the background noise levels in the testing booth or room
  - Records of audiometric calibrations of testing equipment
3. Each employee-owner's annual audiogram will be compared to the baseline audiogram to determine if there has been a threshold shift. The physician will review problem audiograms and determine whether there is a need for further evaluation.
4. Audiometric test records will include:
  - Name and job classification of the employee-owner
  - Date of the audiogram
  - Date of the audiogram
  - Date of last acoustical calibration of the audiometer
  - Measurements of the background sound pressure level in the audiometric test booth



- 
- The signature of the technician performing the test
5. Each employee-owner will be notified in writing as to the results of both the personal exposure monitoring and the audiometric test.
  6. Any questions and/or clarification should be directed to the company safety representative.

### **Access to Records**

Records required by this program and/or OSHA standards will be supplied upon request to the affected employee-owners and former employees.



---

## 17. Crystalline Silica

### General Requirements

1. Unprotected exposures to airborne crystalline silica can result in a chronic, obstructive pulmonary (lung) disease called silicosis.
2. Employee-owners can be exposed to crystalline silica when:
  - They are working in or around operations involving mixing or blending one or more dry components that contain quartz, cristobalite, or tridymite, commonly referred to as silica sand, free silica, or Tripoli.
  - Exposure can also occur when employee-owners are performing work tasks such as hammering or drilling rock, abrasive blasting, mixing concrete, and when drilling, sawing, or jackhammering concrete, bricks, slabs, and some insulating refractory materials. Crystalline silica exposures can also occur during gunite operations and when operating a pug mill or rock crusher.

A Company safety representative will conduct personal air sampling when employees are involved in operations giving rise to crystalline silica exposure:

Air monitoring should be conducted to determine the airborne concentration of silica dust that the employees may be exposed to and to ensure that controls are providing adequate protection for the employees. In the case of abrasive blasting operations, substances other than silica may require analysis, i.e., lead and cadmium.

Exposure monitoring will consist of personal respirable dust samples collected from the employee's breathing zone.

Where it has been determined that personnel are exposed to silica above the PEL, exposure monitoring should be conducted quarterly.

- Such monitoring will be conducted to determine the employee/owner classification and expected corresponding exposure level;
- Determine the appropriateness and effectiveness of the PPE utilized for protection (including respirators); and



- 
- Determine other hazardous substance content when the work task involves abrasive blasting (such as lead and cadmium).
3. The Safety Data Sheet (SDS) will be used to determine if the material contains crystalline silica. Any material suspected of containing crystalline silica for which an SDS is not available will be tested as directed by a Company safety representative (bulk sampling). Any material containing 1% or more of crystalline silica is considered silica-containing material and requires PPE and personal monitoring.
  4. Exposure monitoring will be completed quarterly for operations giving rise to exposures (without regard for PPE use) above the OSHA-PEL.
  5. Employee-owners will be notified regarding the results of the personal monitoring.
  6. When possible, work assignments involving silica exposure should be conducted wet to minimize the airborne concentration of silica dust.

### **Medical Surveillance**

A medical surveillance program will be instituted for all personnel who are or will be chronically exposed to airborne concentrations of silica above the permissible exposure limit 30 days or more per annual year.

Medical examinations will include a complete medical history and physical exam including a chest x-ray and pulmonary function test. Examinations should be given to personnel before their assignment to areas in which airborne concentrations of silica are above the PEL and at the end of employment unless the medical examination has been conducted within six (6) months of termination of employment. Examinations will be repeated every five years if the personnel has under 20 years of exposure potential and every two years if the history of exposure is over 20 years of exposure.

All affected personnel will be notified in writing of the results of the monitoring and physical examinations. Medical records will be maintained for 30 years following the employee's termination of employment.



1. A medical surveillance program will be instituted for employee-owners who are chronically exposed to airborne concentrations of silica above the OSHA-PEL. The Company Safety Director or other medical specialist will determine the need for this program and the employee-owners to be included.
2. The medical surveillance program will include a complete medical/occupational history, physical examination including pulmonary function testing (PFT), and as determined by the examining physician, chest x-rays.
3. Baseline examinations should be given to employee-owners who will be required to operate concrete saws and sandblast.
4. In compliance with OSHA standards, employee-owners will be notified of the results of the examination.

### **Personal Protective Equipment**

Whenever engineering and/or administrative controls are not feasible to reduce the silica exposure below the OSHA-PEL, or in the interim, where tasks produce acute exposures and personal sampling has not been completed, the following PPE should be utilized:

- Protective clothing:
  - i) Utilize coveralls to prevent the accumulation of silica dust on clothes that will be worn off the job.
  - ii) Collect the coveralls in bags and label before leaving the worksite.
  - iii) Vacuum cleaning (vacuums equipped with HEPA-High Efficiency Particulate Air Filter) can be utilized to clean work cloths when the use of coveralls is not practical.
- Respiratory Protection will be utilized as recommended by the Company safety representative and following the respiratory protection section of this manual and the OSHA 1926.103 standard. Respiratory protection should not be used as the primary protection method. Engineering and administrative controls should be utilized in conjunction with respiratory protection.



---

## Exposure Control Methods

1. Substitute less hazardous materials for those containing crystalline silica. To the extent possible, do not use silica sand or other substances containing more than 1% crystalline silica.
2. Where feasible, use engineering controls and containment methods such as blast cleaning machines and cabinets to control the dust and protect adjacent workers from exposure.
3. Use wet methods to control dust at the point of generation. Dust can be significantly reduced by wetting materials before sweeping, chipping, and/or cutting with power tools.
4. Ventilation may be used as a control method, provisions must be made for regular, periodic inspections of the ventilating system to ensure functional operation.
5. Provide Personal Hygiene Facilities such as adequate handwashing stations maintained and provided with soap and towels.
6. Establish separate eating facilities away from exposure. Food, drinks, tobacco products, and applying cosmetics are prohibited in work areas.
7. Maintain all exposed surfaces free of accumulated silica dust. Prohibit the use of dry sweeping and the use of compressed air for cleaning surfaces.
8. Clean surfaces and clothing using a vacuum equipped with High-Efficiency Particulate Air Filters (HEPA).
9. Post warning signs to mark the boundaries of work areas contaminated with crystalline silica.
10. Provide personnel with training information about health effects, work practices, and protective equipment for crystalline silica.

Where feasible:

11. Use a substitute for material containing more than 1% crystalline silica.



- 
12. Use engineering controls such as the use of a sandblasting cabinet to contain the crystalline silica sand.
  13. Use wet methods to control dust generation at the point of operation. CAUTION: The use of water may create slippery conditions in the work area. Ensure that any water generated is properly contained or controlled to eliminate slips and falls.
  14. Use ventilation systems in closed spaces to evacuate the dust.

## Training

Required:

1. Provide access to personal hygiene facilities to allow for hand washing equipped with soap and towels.
2. Designate areas away from exposure for eating, drinking, using tobacco products, and applying cosmetics.
3. Train and document:

All employees who may be potentially exposed to crystalline silica will be given initial training, with an annual refresher in the following:

4. Hazard Communication Standard with specific emphasis on crystalline silica.
5. Hazards of exposure to crystalline silica.
6. Specific operations that can result in exposure to silica above the PEL.
7. Safe work practices for handling and control of release of silica.
8. Housekeeping practices.
9. Purpose, proper use, and limitations of PPE.

All training will be documented and filed following AB&R's policy in training and documentation.

- Hazard Communication;
- Specific hazards of crystalline silica exposure
- Operations that have the potential to exceed the OSHA-PEL;





- 
- Exposure control methods, including required PPE;
  - Housekeeping practices;
  - Designated food, drinking, tobacco use, and cosmetic application area;
  - Location of hygiene facilities

AB&R will follow OSHA's Table 1, listed in the appendices.



---

## 18. Personal Protective Equipment

### Policy

Whenever hazards cannot be effectively eliminated or mitigated with engineering controls appropriate personal protective equipment (PPE) shall be required. This procedure covers personal protective equipment standards required for work at any company jobsite.

### Responsibilities

#### *Safety Director Designee*

The Safety Director or designee is responsible for:

- Developing guidelines for the selection, care, and use of personal protective equipment
- Providing training materials on PPE
- Auditing compliance with this procedure

#### *Project Manager/Superintendent*

The Project Manager/Superintendent is responsible for implementing and monitoring compliance with the requirements of this procedure.

#### *Foremen*

Each foreman must ensure that each employee-owner in his crew has and wears the appropriate PPE for each job.

### General Requirements

1. Employee-owners must come to the project with personal protective equipment (PPE) as required to safely perform their assigned work. At a minimum, employee-owners are required to wear a hard hat, ANSI-approved safety glasses, hand protection, and leatherwork boots. Some job sites do mandate steel-toed work boots and these are recommended for most construction activities.



- 
2. Employee-owners receive training on the proper use, storage, and care of PPE during hiring, specialized training courses, and as job site conditions dictate. Such training will be documented and maintained electronically within HCSS.  
  
Since construction sites are more dynamic (changing), PPE assessments would be of less value since they are intended for more repetitive operations. However, general PPE requirements and specific PPE requirements for work tasks and/or equipment use are discussed throughout this manual. For construction site exposures, properly executed job safety analysis evaluations (those that contain PPE requirements) can be substituted for the formal general industry-required assessments. Project supervision should request the assistance of a company safety representative to implement a job safety analysis program.
  3. Austin Bridge & Road will supply the following required safety equipment: hardhat, safety vest, safety glasses, hearing protection, and hand protection.
    - Employee-owners will be expected to provide their sturdy leatherwork boots with substantial soles. All equipment provided by the company or personally owned will be cleaned and maintained in good serviceable condition.

### **Head Protection**

1. Hard hats are to be worn at all times in construction areas no class C hard hats are allowed (such as bump caps).
2. Metallic hard hats are prohibited.
3. Non-conventional hard hats such as the “Western Style” shall not be used on AB&R construction sites.
4. Before each use, hard hats must be inspected for cracks, signs of impact, or rough treatment and wear that might reduce the degree of safety originally provided. If signs of excess wear exist, the hard hat must be replaced.
5. Hard hat suspensions may not be altered.
6. Hard hats are to be worn with the bill to the front as provided by the manufacturer. Hard hats may not be worn backward.



- 
7. If face protection (face shields) are required to be worn in addition to head or specialized hearing protection, face shields must be provided that can be worn with a hard hat.

### **Hearing Protection**

1. Employee-owners working in an area where extreme levels of noise exist should contact the company safety representative for noise level testing. Employee-owners will be furnished with approved type hearing protection. Working with certain pneumatic tools, working in confined spaces, chipping concrete, jackhammering and the use of metal and masonry saws, or similar type operations are possible work assignments that could cause exposure.
2. Operators of heavy equipment who are exposed to excessive levels of noise for a continuous period should be outfitted with earplugs, earmuffs, or any other approved hearing protective device that will reduce harmful noise levels.
3. Plain cotton is not an acceptable hearing protective device.

Noise levels vary in different areas of a construction site, asphalt plants, and equipment shops and individual employee-owner's exposures vary according to the area noise levels and the time spent in those areas. Your company safety representative should be contacted to gain assistance in measuring area noise levels and employee-owner exposure levels. Your safety representative can compare the results of such testing with the applicable OSHA standards (since standards vary for construction and general industry sites). Additionally, the safety representative can advise as to the need for and requirements of a comprehensive hearing conservation program, the appropriate type of hearing protection, and the use of hazard warning signs.

### **Eye and Face Protection**

1. Employee-owners must be provided with approved eye and face protection equipment when machines or operations present potential eye or face injury (physical or chemical).
2. Examples of operations that require goggles or face shields include chipping concrete, rubbing concrete, grinding, and operating a chain saw, lime stabilization, or similar type operations.



- 
3. Employee-owners must wear ANSI Z87+ approved eye protection at all times on the work site unless inside an office or in a completely enclosed cab of heavy equipment. However, when the operator leaves the cab or opens the door of the cab, safety glasses will be used.
  4. Special eye hazard work (such as welding or torch work) requires additional eye protection such as a welder's hood and/or cutting goggles as appropriate.
  5. Goggles must be worn if the potential exists for fine particles, dust, or chemicals to enter the eyes. Goggles also provide additional protection for extremely dusty working situations.
  6. Dark-tinted eye protection is not allowed inside facilities or structures unless specifically required and approved by project management. Dark-tinted eye protection should not be utilized for night or pre-dawn work (except for welding or cutting operations conducted within specified work areas and then only during the actual operation).
  7. Visitors must use approved eye protection while on the job site.
  8. Eyewear that meets the ANSI Z87+ standard must be worn over prescription glasses for access to project work areas until prescription protective eyewear can be obtained, if applicable.
  9. Face shields in addition to safety glasses must be worn when the hazard of flying debris could contact employee-owner's face. Examples: grinding and handling acids or molten materials, cutting rebar.

### **Respiratory Protection**

Appropriate respiratory protective devices must be provided and used when effective means of ventilation cannot be achieved. Operations under this requirement may include welding, some earth-moving operations, chemical handling, and similar work.

Note: See specific requirements under Section 13 titled "Respiratory Requirements" in this manual.



1. If a project plan, pre-task plan or exposure monitoring determines that the use of a respirator is required to safeguard employee-owners adequately, employee-owners must be trained, fitted, and supplied an appropriate respirator.
2. Employee-owners required to wear a respirator must complete the OSHA-required medical questionnaire and have current medical authorization to use a respirator.
3. Respirators may not be shared. Each employee-owner requiring respiratory protection must be issued sanitary equipment. This equipment must be properly stored, when not being used so that cleanliness is maintained.
4. Anyone wearing a respirator must be clean-shaven to ensure a secure face-to-respirator seal.
5. Personnel required to use a respirator while working must be trained. Document such training and maintain the training records in the project safety file and/or in the Company database.

### **Toe and Foot Protection**

1. Sturdy, leatherwork shoes/boots (steel-toed and ankle height preferred) must be worn by employee-owners who work in the field.
2. Tennis shoes or other soft-soled shoes, including sandals and hiking boots, are prohibited.
3. Metal foot protectors and/or metatarsal guards should be worn when operating some equipment such as (jackhammers, hydro-blasters, tampers, or similar devices) that can cause injury to feet.
4. Personnel performing tamping and air hammering processes must wear metatarsal and steel toe guards.

Note: The use of steel-toe safety boots and/or metatarsal guards is best identified and defined as part of a “Job Hazard Analysis” conducted by the foreman with the crew before starting work.



---

## Body Protection

1. Where chemical hazards (such as corrosives) are present, protective clothing must be provided to all affected employee-owners. The protection provided must be resistant to the hazards created by the properties of the chemicals to be used. Decontaminate any reusable clothing before storing it.
2. For hazard-specific protection, e.g., electrical hazards refer to the appropriate procedure or guideline in this manual.
3. When welding, the neck and face must be protected from arc and spark burns. Fire-retardant clothing, leather sleeves, and/or apron must be worn as appropriate for welding and cutting operations to protect the operator.
4. Employee-owners are required to wear long pants and shirts with sleeves at least four inches in length and/or long-sleeved shirts.
5. Shirrtails must be tucked into pants while performing grinding or similar operations where the shirt could become entangled or cause injury.
6. Long-sleeved shirts, if not properly buttoned, must be rolled up above the elbows.
7. Sleeveless shirts are not permitted.
8. Working without a shirt is prohibited.

## Traffic Safety Warning Vests

1. Reflective traffic warning vests must be worn at all times on the job site to ensure maximum visibility.
2. Vests are required during day and night operations and therefore must be highly visible and reflective.

## 100% Hand Protection

Hand and Finger injuries are the highest frequency body part injury type in highway construction. The following five points should be used to identify and mitigate hand injuries.

1. Keep hands away from **Pinch Points** and crushing hazards. A large number of hand and finger injuries result when they are caught between objects. This



---

happens frequently when handling materials. Inspect materials for slivers, jagged edges, burrs, and rough or slippery surfaces

2. Use the correct **Hand/Power Tools** for the job and use them properly.
3. Always wear the **Proper Gloves** according to a thorough hazard assessment or JHA.
4. Make sure all **Equipment/Safe Guarding** is in place before beginning any job and stays in place until the job is completed.
5. Always de-energize, perform **Lockout/Tagout**, and verify Zero Energy State on machinery and equipment before reaching into repair, cleaning, maintenance, or making adjustments.

The following are examples of common hand injury hazards:

- When metal materials with sharp edges are being handled
- Cutting operations involving hand-held, non-power-operated cutters
- Handling wood materials (splinter protection)
- Concrete operations where hands are exposed (protection from chemical burns from the alkaline contained in the cement)
- While pulling wire in or around electrical panels (non-conductive contact protection)
- While performing energized electrical work (EEW voltage gloves to prevent contact with live parts)
- Using powder-actuated power tools
- During welding operations
- While operating hand-held grinders (helpers must also wear gloves for protection from flying debris)
- Working on or near materials subject to extreme temperatures
- Handling hazardous materials, which require the use of hand protection to avoid skin contact as indicated on Safety Data Sheets (SDS)





- Working with glass materials where the edges are exposed and present a hazard
- Removal and handling of trash

Different exposures require the use of different types of gloves. Evaluate each situation to determine the appropriate type of protection to use

Hand protection will be utilized 100% by all employee-owners. This requirement will be for any EO or sub worker exiting a vehicle onto an ABR-affiliated construction area.

Hand protection is not required in an office unless a specific hand injury risk is present (for example: changing light bulbs, maintenance on plumbing or doorways, etc.)

If a work operation creates a greater risk for wearing hand protection, such as operating a rotating tool or piece of equipment, hand protection is not required.

The level of required hand protection must be considered for all work tasks.

ANSI cut ratings A4 and A5 are intended for general hazards. The higher the A value of the glove, the higher the cut/crush rating.

Work operations that involve work with sharp objects, for example using a utility knife, or handling/cutting steel, require a minimum A6 cut rating.

Project management shall provide gloves rated for the hazard and enforce their mandatory use at all times.

Inspect gloves before each use for visible signs of damage. If a concern is identified exchange the damaged glove with your foreman.

Glove requirements are further summarized as follows:

Energized Electrical Work (EEW):	Rated rubber gloves with leather protectors
Welding/Cutting operations:	Gauntlet-type leather welding gloves
General hazard work operations:	Minimum A4 Cut/A1 Crush gloves
Exposure to sharp edges and metal burrs:	Minimum A6 Cut gloves



Utility knives:	Minimum A6 Cut Gloves
Concrete work:	Rubber or leather gloves; if exposure to covering the glove, the glove must be impermeable.
Exposure to petroleum products:	Chemical-resistant gloves per the SDS
Exposure to hazardous materials such as solvents, paints, adhesives, etc.:	Chemical-resistant gloves per the SDS
Impact tools (Jackhammer, etc)	Anti-vibratory hand protection

**Leg, Thigh, Knee, Shin and Ankle Protection**

Appropriate work pants that cover the full leg are required for all employee-owners. Overalls, coveralls, or other appropriate protective clothing are acceptable. No shorts are allowed in construction areas.

- Overalls or pants must not allow skin to be exposed (no holes or tears)
- Pointed tools may not be carried in pockets. A canvas or leather tool sheath hung from the belt is acceptable (all points down)
- Employees-owners operating chain saws must wear chaps designed to protect the legs.

**Safety Harnesses**

Fall protection must be provided for all employee-owners exposed to a fall of six feet or greater in construction, 4 feet or higher in general industry. Refer to the "Fall Protection" section of this manual for more details. If personal fall protection equipment is to be used, it shall consist of a full body harness, lanyard with a deceleration device and appropriate anchor points. It is the responsibility of the supervisor to see that adequate fall protection is furnished and used by all employee-owners. Consult the OSHA Construction Standards and/or contact the company safety representative for more specific requirements.



---

## 19. Fire Protection, Prevention, and Emergency Action

### Fire Protection

1. The phone numbers of the nearest fire station or department must be posted at job site telephone or in each company vehicle for projects not having offices.
2. Two-ton or larger trucks, cranes, and other heavy equipment must be equipped with the designated size and type of fire extinguisher required (examples include winch trucks, haul trucks, draglines, and cranes). Contact your safety representative to determine the correct size and type.
3. A fire extinguisher rated not less than 10B shall be provided within 50 feet of wherever more than five gallons of flammable or combustible liquids or five pounds of flammable gas are being used on the job site. This requirement does not apply to the integral fuel tanks of motor vehicles. However, fuel service trucks will be equipped with at least a minimum of one 20 lb. (Type A, B, C or Type B, C) fire extinguisher.
4. Carbon tetrachloride and other toxic vaporizing fire extinguishers are prohibited.
5. Fire extinguishers must be inspected every month by the operator and serviced at least every twelve months by an approved vendor. Refills and repairs must be made by a local dealer licensed by the state to service the fire extinguisher or suppression system used.
6. Familiarize yourself along with the members of the crew, with the use and care of these extinguishers. Make sure everyone knows where the fire extinguishers are and how to use them. Supervisors must conduct a toolbox safety meeting on this subject at least annually and with new employee-owners.
7. It is everyone's responsibility to comply with the following:
  - a. Smoke only in designated areas. Make sure to extinguish matches/cigarettes and place them in approved containers.
  - b. Minimize the amount of flammable liquids/gases kept in the work area to a daily supply.



- 
- c. Close containers of flammable liquids when not in use. Report spills and the location of excessive flammable vapor/gas concentrations immediately.
  - d. Obtain the necessary permits if required/applicable or obtain permission from the foreman when performing welding or cutting and/or disabling fire protection systems.
  - e. Make sure materials and equipment do not block access to extinguishers and fire protection hoses, hydrants, and standpipes. Make sure materials are kept at least 18 inches from sprinkler heads.
  - f. Attempt to extinguish small fires (trash can size) only if trained to do so. If trained to extinguish fires, familiarize yourself with the location of fire extinguishers in the work area.
8. At least one portable fire extinguisher of not less than 20 B rating must be located not less than 25 feet or more than 75 feet from a flammable combustible liquid storage area located outside.
  9. Since heavy/highway construction is constantly changing, fire extinguisher location is important. Company vehicles and equipment required to be equipped with fire extinguishers should have them mounted in such a manner as to ensure that they are readily available when needed. Welding or cutting operations must not be undertaken unless the appropriate fire extinguisher is located in the immediate area.
  10. Diesel salamanders are prohibited on the construction site. If hot air equipment is needed to cure, concrete in cold weather or to perform other construction-related activities, contact your safety representative for guidance.

## **Fire Prevention**

1. Internal combustion-powered equipment shall be inspected and repaired when cool to prevent hazards such as ignition of fuel.
2. Fueling areas or stations require the following:
  - a. "No Smoking" signs must be posted and enforced



- 
- b. "Turn Engines Off" signs must be posted and enforced in the same area
  - c. Bonding of equipment to be fueled must be accomplished through the use of an internally grounded hose or an external ground cable
  - d. Fuel tanks must be appropriately labeled flammable or combustible and gasoline or diesel
3. Make sure that fuel distributor trucks comply with fuel tank, dispensing hose, and nozzle specifications as required by Federal, State, or local Municipalities.
  4. Approved industrial use metal safety cans must be used for the handling and storage of flammable and combustible liquids up to 60 gallons and must be labeled as to the contents.
  5. Portable storage tanks with a capacity of 60 gallons or more must be:
    - a. marked as to contents
    - b. Located at least 50 feet away from any building
    - c. Kept free from debris, trash, grass, and weeds at all time
    - d. Properly vented, if storing 600 gallons or more
  6. Two or more portable storage tanks (each having a 1000-gallon capacity or larger) must be separated by at least a 5-foot clear area.
  7. Company safety representatives must be contacted for additional rules governing fueling depots or storage areas for flammable/combustible liquids.
  8. Refer to "Austin Environmental Quality Assurance Manual" for additional requirements.

### **Exits, Emergency Action Planning and Alarms**

Since heavy/highway construction is spread out and in open areas not restricted by passageways, doors, isles, or confined to a building, the following requirements primarily apply to asphalt plants, offices, equipment shops, and storage facilities.

However, every heavy/highway construction site must have radio/phone communications (if more than 10 employee-owners are assigned) to be used for emergencies. Employee-owners will be instructed during orientation by the human



---

resources department and/or their supervisor, and subsequent safety training sessions, as to what emergencies are likely to occur, how to react, how to respond, where to assemble, and how to perform headcount procedures.

### **Exits and Exit Access**

1. In buildings or other structures exits shall be so arranged and maintained as to provide free and unobstructed exit (egress) from occupied areas. No doors shall be locked in such a manner as to prevent exit from a building or structure.
2. Approved readily visible signs shall indicate exits in buildings. Access to exits shall be indicated through the use of signs when the exits or route to reach them is not readily visible to the occupants.
3. Exits and access shall be maintained free of obstructions in case of fire or other emergency.

### **Emergency Action Planning**

1. The plan should take into consideration emergencies reasonably expected to occur such as fire, weather-related events, earthquakes, and similar potential possibilities.
2. The following minimum requirements must be contained in the emergency plan:
  - Emergency escape procedures and routes
  - Procedures to be followed by personnel remaining to operate critical equipment before evacuating (possibly crane operators)
  - Assembly areas (at least a primary and alternate site for personnel to assemble and to be accounted for)
  - Procedure to account for personnel after emergency evacuation is complete
  - Location and routes to severe weather shelter(s)
  - Rescue and medical duties if to be performed by employee-owners
  - Means to report emergencies to local agencies for assistance
  - Person to be contacted regarding the plan and to answer any questions



- 
- The emergency evacuation plan will be reviewed periodically, minimum annually.

Contact your company safety representative to gain assistance with emergency action planning and alarm systems requirements.



---

## 20. Signs and Signals

### Signs

Warning signs must be visible at all times and removed when the hazard no longer exists.

1. Danger signs/Barricades - used where imminent hazards exist
2. Caution signs/Barricades - used to warn against potential hazards or to caution against unsafe practices
3. Exit signs - used to indicate egress routes
4. Direction signs (other than vehicular) - used to indicate routing
5. Traffic Signs - construction areas must be posted with traffic signs before and at points of hazards
6. Accident Prevention/Out-of-Service tags - used as a temporary means of warning, or to warn employee-owners not to use equipment

### Signals

Note: See specific requirements for flag persons in the section of this manual titled Traffic Flagging.

1. Crane and hoist signals must be posted on the crane or hoist.
2. Only properly trained personnel are allowed to signal the crane operator. If no one is available, someone must be trained in the proper signaling of the crane operator and must demonstrate his or her capability before being assigned.
3. Only one person is to signal a crane operator; multiple personnel signaling to an operator can lead to operator confusion and increase the potential for mistakes to be made. Relay signaling can be used when the situation demands such action but the project superintendent must authorize the activity and a specific safety meeting must be conducted to include the crane operator and personnel assigned to signal. Any relay signaling will require the signal persons to be equipped with radio communications in addition to being stationed in clear sight of one another.





**Barricades**

1. Barricades, safety signs, stanchions, safety cones, or safety warning tape or ribbon must be installed as required to isolate and protect unsafe work areas from workers, pedestrians, and/or vehicle traffic.
2. The swing radius around cranes will be barricaded to protect employee-owners from pinch points.
3. Barricades and signs must be removed after work is complete and the hazard is eliminated.
4. Barricading by hazard category:

Barricade Color	Hazard Class	Action	Example
Yellow	Occupational Hazard	Do not cross until a hazard is identified and safe passage, access is assured.	Open floor grate, overhead work, trip hazard areas.
Red	High and/or Imminent Hazard/Fatality Prevention	Never cross --if access is required; coordinate with the contact person identified on barricade signs.	Electrical energized work in progress; overhead suspended load, critical high-pressure test, chemical introduction, and fall exposure.

5. Heavy equipment, vehicle barriers, attenuation devices mounted to equipment and similar materials will be used to protect employee-owners from vehicular traffic on public streets and highways.
6. Concrete traffic barricades will be used as planned and directed by the highway authority having jurisdiction over the project. Any concerns and/or questions should be directed to the Division Manager and/or company safety representative.



- 
7. On every roadway project, at least two representatives will have attended a formal "Traffic Control Training" such as those presented by Texas A&M Engineering Extension or University of Texas Arlington. This individual will be a resource person for the superintendents and foreman to assist them in safely managing traffic flow through our projects.
  8. Pier holes will be barricaded unless steel and/or concrete is placed to prevent someone from falling into the hole.
  9. Covers used as hole barricades on bridge decks will be labeled "Hole/HOYO". The covers will be substantial and capable of supporting the intended weight. Covers will be secured from movement.
  10. Many falls occur during cover removal operations. Employee-owners assigned to remove covers will be protected from fall exposure through the use of a body harness, lanyard, and appropriate attachment point for anchorage. Please see the "Fall Protection" section of this manual.



---

## 21. Material Handling

### General Requirements for Storage

#### 1. General

- Materials must be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse.
- When a difference in road or working levels exists, means such as ramps, blocking, or grading must be used to ensure the safe movement of vehicles between the two levels.

#### 2. Material Storage

- Employee-owners required to work in silos, column forms, hoppers, tanks, and similar storage work areas must be equipped with lifelines and safety harnesses with an attendant stationed outside the structure to retrieve personnel in case of emergency (see Section 8, Confined Space Entry, for additional requirements).
- Non-compatible materials must be segregated in storage (check Safety Data Sheets).
- Bagged materials may be stacked by stepping back the layers and cross keying the bags at least every 10 bags high.
- Materials may not be stored on scaffolds or runways in excess of supplies needed for immediate work operations (no materials shall be stored on light-duty scaffolding).

#### 3. Storage of Lumber

- Used lumber that is to be re-used must have nails withdrawn before stacking. Other lumber must have nails bent over to protect from puncture injuries.
- Lumber must be stacked level and solidly supported sill
- Lumber must be stacked so as to be stable and self-supporting



- 
- Lumber may not be stacked higher than 10 feet
4. Cylindrical Materials- structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, must be stacked and blocked to prevent spreading and roll-out or tilting.

## **Rigging Equipment for Material Handling**

### **1. General**

- Rigging equipment for material handling must be inspected before each use. Defective rigging equipment must be removed from service. Rigging should be identified by tag or other device so that inspection and maintenance can be tracked.
- Rigging equipment may not be loaded in excess of its recommended safe working load.
- Non-manufactured (home-made) lifting equipment (spreader bars, lifting eyes, pears, and similar equipment) shall not be used unless approved by a qualified engineer and the equipment so identified that it can be directly traced to a set of prints and/or documents containing the approving engineers' stamp and signature. No homemade slings.
- No cable containing splices shall be used for lifting (cable must be one continuous piece).

### **2. Alloy Steel Chains**

- Shall not be used on-site without the approval of a Safety Director and Superintendent.

### **3. Wire ropes**

- If upon visual inspection a hoisting cable is damaged in any way, it must be replaced and immediately discarded

### **4. Hooks**

- The equipment department should be contacted to make sure that a hook is capable of hoisting a load adequately and safely.



- 
- Hooks that have been sprung must be removed from service and returned to the equipment department. Sprung hooks may not be used to pick up any loads.
  - Safety latches must be installed and maintained on load-hoisting hooks. Use of wire, bolts, nails, and similar materials shall not be used as substitutes for the manufactured hook safety latch.

### **Disposal of Waste Material**

1. Scrap lumber, waste material, and rubbish must be removed from work areas as the work progresses.
2. Disposal of waste material or debris by burning must comply with local fire regulations (usually requiring the use of a trench burner).
3. Solvent wastes, oily rags, and flammable liquids must be kept in fire-resistant covered containers until removed from the work site.
4. Waste oil from equipment may not be dumped at any site.
5. A company safety representative must be contacted for information concerning the disposal of hazardous chemicals and hazardous material containers.

Note: Contact a company safety representative for assistance with proper waste disposal methods that comply with environmental regulations and refer to the “Environmental Quality Assurance Manual” for additional details.



---

## 22. Tools: Hand and Power

### General Instructions

Hand tools and similar equipment must be maintained in a safe condition and have current certificates as required by law. No job-built/homemade tools, wrenches, or equipment will be authorized for use at any company location.

1. Equipment must be inspected daily before use by any operator. Inspections of the work area must include tool inspections.
2. Tools not meeting the manufacturer's safety specifications shall be taken out of service and stored in a identified storage receptacle indicating "Do Not Use - Needs Repair" and/or tagged indicating that the tool has been taken out of service.
3. Personal protective equipment must be specified and provided for use with each powered equipment or tool type.
4. Stationary tools or grinding machines must be securely mounted to prevent movement or injury. Wheel guards and tool rests must be properly adjusted before each use- 1/4" for guards and 1/8" for tool rests.
5. Portable electrically powered tools must be grounded or double insulated (via GFCI protectors).

### Guarding

1. When power operated, tools are designed to accommodate guards, they must be equipped with the guards even if not delivered with the tool and they must be ordered separately.
2. Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains or other reciprocating, rotating or moving parts of equipment must be guarded if such parts are exposed to contact by employee-owners or otherwise create a hazard.
3. Pinch points and other machine hazards must be guarded. Guards provided by the tool manufacturer must be in place at all times. Equipment may NOT be used or customized for work other than for its originally intended purpose.



---

## **Personal Protective Equipment**

Employee-owners using hand and power tools and exposed to the hazards of falling, flying, abrasive or splashing objects, or harmful dust, fumes, mist, vapor or gases, must be provided with the specified personal protective equipment necessary to protect them from the hazard. Refer to the Personal Protective Equipment section of this manual for specific PPE requirements and refer to the manufacturer's specifications.

### **Constant Pressure Switch**

Hand-held power tools with an external blade, 3 1/2-inch diameter or larger must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

### **Hand Tools**

1. Supervisors may not issue or permit the use of unsafe hand tools.
2. Wrenches, including pipe, end, and socket wrenches, may not be used when the jaws are sprung to the point that slippage occurs.
3. Impact tools such as drift pins, wedges, and chisels, must be kept free of mushroomed heads.
4. The wooden handles of tools must be kept free of splinters or cracks and kept tight in the tool.

### **Power Operated Hand Tools**

1. Electric Power-operated Tools:
  - Electric power-operated tools must be either approved double-insulated type or be grounded through the use of a three-wire system
  - Manufacturer tags and labels that show whether the tool is double insulated, RPM rating, voltage, etc. must be in place and legible on electric power tools
  - The use of electric cords for hoisting or lowering tools is not permitted
  - The Ground Fault Circuit Interrupter (GFCI) program must be in place for temporary construction power use



- 
- The ground plug must be present on electrically powered tools unless double-insulated
  - Damaged cords (cuts, exposed wire, loose strain relief, etc.) must be replaced. Tape is not an acceptable repair for electrical cords

**2. Pneumatic Power Tools:**

- Pneumatic power tools must be secured to the hose or whip by some positive means to prevent the tool from becoming disconnected accidentally
- Safety clips or retainers must be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled
- Compressed air may not be used for cleaning purposes except when reduced to less than 30 PSI and with effective chip guarding and personal protective equipment. The 30-PSI requirement does not apply to concrete form, mill scale, and similar purposes.
- The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings may not be exceeded
- The use of hoses for hoisting or lowering tools is not permitted
- Hoses exceeding ½" inside diameter must have a safety device (excess flow valve) at the source of supply or branch line to reduce pressure in case of hose failure

**3. Fuel-powered Tools:**

- Fuel-powered tools must be stopped while being refueled serviced or maintained, and fuels must be transported, handled, and stored following fire prevention standards
- When fuel-powered tools are used in enclosed spaces, the applicable requirements for concentrations of toxic gases and the use of personal protective equipment apply





- 
- Fire extinguisher must be available during operation

**4. Powder-Actuated Tools:**

- Only employee-owners who have been trained in the operation of the particular tool may be allowed to operate a powder-actuated tool. Operators must receive instructions and carry the operator's card with them when using powder-actuated tools.
- The tool must be tested each day before loading to determine if safety devices are in proper working condition. The method of testing must be in accordance with the manufacturer's recommended procedure.
- Any tool found not in proper working order or that develops a defect during use must be tagged "Defective, Out-of-service" immediately, removed from service and not used until properly repaired by the manufacturer's representative
- Tools may not be loaded until just prior to the intended firing time. Neither loaded nor empty tools may be pointed at an employee-owner. Hands must be kept clear of the open barrel end.
- Safety glasses with face shields or goggles are required for employee-owners firing power-actuated tools. The manufacturer's recommendations regarding personal protective equipment must be followed.
- Loaded tools may not be left unattended
- Driving into materials easily penetrated must be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying projectile hazard on the other side
- Tools may not be used in an explosive or flammable atmosphere
- Tools must be used with the correct shield, guard or attachment recommended by the manufacturer



- 
- Misfired cartridges must be segregated from fired cartridges and disposed of per the manufacturer's recommendation
  - Fired cartridges must be disposed of properly and not allowed to accumulate on the floor or in the work area

## **Abrasive Wheels and Tools**

### **1. Power:**

- Grinding machines must be supplied with sufficient power to maintain the spindle speed at safe levels under conditions of normal operations.

### **2. Abrasive Wheels:**

- Floor stand and bench-mounted abrasive wheels used for external grinding must be provided with safety guards (protection hoods). The maximum angular exposure of the grinding wheel and sides must not be more than 90 degrees except that, when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure may not exceed 125 degrees. In either case, the exposure must begin not more than 65 degrees above the horizontal plane of the spindle. Safety guards must be strong enough to withstand the effect of a breaking wheel.
- Floor- and bench-mounted grinders must be provided with work rests, which are rigidly supported and adjustable. Work rests must be kept at a distance not to exceed 1/8" from the surface of the wheel.
- Cup-type abrasive wheels used for external grinding must be protected by a revolving cup guard. Other portable abrasive wheels used for external grinding must be provided with safety guards.
- The maximum angular exposure of a portable grinding wheel and sides may not exceed 180 degrees.
- Abrasive grinding wheels must be inspected before installation and before use to ensure that the grinder's RPM does not exceed the wheels/disc rating.

- 
- Grinding or abrasive wheels must be inspected before use to ensure that the grinding surface has not been plated by a soft metal. Soft metal can cause the wheel to become super-heated and break during subsequent grinding of hard metals. Soft metal accumulations must be removed or the wheel must be replaced.
  - Abrasive wheels must be closely inspected before mounting to verify they are free from cracks or defects.
  - Grinding wheels must fit freely on the spindle and may not be forced on. The spindle nut must be tightened only enough to hold the wheel in place.
  - Employee-owners using abrasive wheels, whether portable, bench- or floor-mounted, must be protected by approved eye and face protective equipment.
  - Grinding and abrasive wheels must be stored before use in a manner to prevent chipping or cracking. Storage bins lined with wood shavings, storage in shipping containers and/or similar storage manner must be satisfactory to protect the wheels while in storage.
  - To prevent use on or off the project site, broken, used, and discarded grinding or abrasive wheels must be collected at a central point and disposed of properly.

### **Woodworking Tools**

1. Fixed power-driven woodworking tools must be provided with a disconnect switch that can either be locked or tagged in the off position.
2. Portable power-driven circular saws must be equipped with guards above and below the base plate or shoe. The upper guard must cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guards must cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard must automatically and instantly return to the covering position.



---

## Woodworking Machinery

### 1. Machine Construction

- Machines must be constructed to be free from sensible vibration when the largest size tool is mounted and run at idle or full speed
- Arbors and mandrels must be constructed to have firm and secure bearing and be free from play
- Circular saw fences must be constructed so they can be secured firmly to the table or table assembly without changing alignment with the saw. For saws with tilting tables or tilting arbors, the fence must be constructed to remain in a line parallel with the saw, regardless of the angle of the saw with the table.
- Circular saw gauges must be constructed to slide in grooves or tracks that are accurately machined and to ensure exact alignment with the saw for positions of the guide
- Hinged saw tables must be constructed so the table can be firmly secured in any position and in true alignment with the saw
- Belts, pulleys, gears, shafts and moving parts must be guarded
- It is required that power-driven woodworking machines be provided with a disconnect switch that can be locked in the off position
- For circular saws where there is a possibility of contact with a portion of the saw either beneath or behind the table, that portion of the saw must be covered with an exhaust hood, or, if no exhaust system is required, with a guard that must be affixed to prevent accidental contact with the saw.
- No saw, cutter head or tool collar may be placed or mounted on a machine arbor unless the tool has been machined in size and shape to fit the arbor accurately



---

## 2. Machine Controls and Equipment

- On machines operated by electric motors, positive means must be provided for rendering the controls and devices inoperable while repairs or adjustments are made to the machine
- Each operating treadle must be protected against unexpected or accidental tripping
- Feeder attachments must have the feed rolls or other movable parts covered or guarded to protect the operator from hazardous points
- A positive restart button must be provided to ensure that the equipment cannot restart by itself after a power failure

## 3. Radial Saws

- The upper hood of radial saws must completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The upper hood must be constructed in a manner and of a material that will protect the operator from flying splinters, broken saw teeth, etc., and will deflect sawdust away from the operator. The sides of the lower exposed portion of the blade must be guarded to the full diameter of the blade by a device that will adjust itself automatically to the thickness of the stock and remain in contact with stock being cut to give the maximum protection possible for the operation being performed.
- Radial saws used for ripping must be provided with non-kickback fingers or dogs so to oppose the thrust or tendency of the saw to pick up the material or throw it back toward the operator. The fingers or dogs must be designed to provide adequate holding power for the thickness of the material being cut.
- An adjustable stop must be provided to prevent the forward travel of the blade beyond the position necessary to complete the cut in repetitive operations.



- 
- Installation must be so the front end of the unit will be slightly higher than the rear - to cause the cutting head to return gently to the starting position when released by the operator (a pulley system may also be used to return the cutting head to the starting position when released by the operator).
  - Ripping and plowing must be against the direction in which the saw turns. The direction of the saw rotation must be conspicuously marked on the hood.

#### 4. Inspection and Maintenance of Woodworking Machinery

- Dull, badly set, improperly filed or improperly tensioned saws must be removed from service immediately before they begin to cause the material to stick, jam or kickback when fed to the saw at normal speed. Saws to which gum has adhered on the sides must be cleaned immediately.
- Knives and cutting heads of woodworking machines must be kept sharp, properly adjusted and firmly secured. Where two or more knives are used in one head, they must be properly balanced.
- Bearings must be kept free from lost motion and must be well-lubricated
- Arbors of circular saws must be free from play
- Sharpening or tensioning of saw blades or cutters must be done only by persons of demonstrated skill and training for this kind of work
- Cleanliness and housekeeping around woodworking machinery is critical, particularly for the effective functioning of guards and the prevention of fire hazards in switch enclosures, bearings, and motors
- Cracked saw blades must be removed from service
- The practice of inserting wedges between the saw disk and the collar to form what is commonly known as a "wobble saw" is not permitted
- Push sticks or push-blocks must be provided as needed.
- Guards must be in place and maintained on woodworking tools before use



---

## **Jacks - Lever, Ratchet, Screw and Hydraulic**

### General Requirements:

1. The manufacturer's rated load capacity must be legibly marked on jacks and may not be exceeded
2. Jacks must have a positive stop to prevent over travel
3. Jacks must have a controlled method for lowering the load
4. When it is necessary to provide a firm foundation, the base of the jack must be blocked or cribbed. Where there is a possibility of slippage of the metal cap of the jack, a wood block (of sufficient size and condition to protect against a falling load) must be placed between the cap and the load.
5. Load capacity shall be noted on the jack stand and the load rating shall not be exceeded

## **Laser Operation**

1. Training:
  - Only qualified and trained employee-owners may be assigned to install, adjust and operate laser equipment.
  - Proof of qualification (Operator Card) of the laser equipment operator must be available and in possession of the operator at all times.
  - The company selling the laser unit will have qualified people to train employee-owners and issue cards attesting to the training received. The supervisor is responsible to ensure that each operator is properly trained, has an operator card and is using the equipment per the training. The supervisor must determine if additional training is necessary when manufacturers/brands are replaced and ensure training records are forwarded to the central files for entry into the Company database.



---

2. Rules:

- Employee-owners working in areas where potential exposures to direct or reflected laser light greater than 0.005 watts (5 milliwatts) must be provided with laser eye-protection devices
- If units are properly researched, the eye protection requirement may not be an issue because most units adapted to normal grade settings over short distances do not emit more than 5 milliwatts
- Areas in which lasers are used must be posted with standard laser warning signs. The sign provided by the manufacturer can be placed on the outside of the carrying case and the case can be positioned in the vertical position so that the warning label is visible to employee-owners working in the area
- Beam shutters or caps must be used or the laser turned off when laser transmission is not required. When the laser is left unattended for a substantial period of time, such as during lunch hours, overnight or shift change, the laser must be turned off
- Only mechanical or electronic means may be used as a detector for guiding the internal alignment of lasers. If internal adjustment is required, it should be done by the manufacturer's representative
- The laser beam may not be directed at employee-owners
- This should be taken into consideration when setting the unit up. Care should be taken to keep employee-owners out of the path of the laser beam.
- When raining or snowing, or when there is dust or fog in the air, the operation of laser systems must be prohibited where practicable since laser beams are deflected by such atmospheric conditions. In any event, employee-owners must be kept out of range of the area of source and target during such weather conditions.





---

3. Equipment Identification:

- Laser equipment must bear a label to indicate maximum output as well as the following information:
  - i) Manufacturer's name and model number.
  - ii) Type of laser head employed as source of light, manufacturer and milliwatt output.
  - iii) Diameter of the beam as it diverges from the instrument.
  - iv) The resultant energy density in milliwatts per square centimeter as it emerges from the instrument.
  - v) Beam size and energy density per square centimeter at given distances from the instrument.

If it is determined from the information that the unit meets company-operating standards, then a copy of the above data will be packed with the instrument.

- Employee-owners may not be exposed to light intensities above the following:
  - vi) Direct staring: 1 microwatt per square centimeter.
  - vii) Incidental observing 1 milliwatt per square centimeter.
  - viii) Instruction of employee-owners and the setting up of the instrument out of the eye level of the employee-owners should assure compliance with these sections.
  - ix) Diffused reflected light: 2½ watts per square centimeter.
  - x) A diffusing target should always be used and maintained to reflect the laser beam.
- When possible, laser units should be set up above the heads of employee-owners.



- 
- Every effort should be made to set the unit up so that the laser beam is above the heads of these employee-owners working around the laser so that they cannot cross the beam with their eyes.
  - Employee-owners may not be exposed to microwave power densities more than 10 milliwatts per square centimeter.



---

## 23. Welding and Cutting

### General

1. A suitable fire extinguisher that is the proper size and type for the work being performed or other fire control device must be ready for instant use in any location where welding is done. Where welding must be performed near combustible materials, a helper or other extra man shall be on hand to guard against fire (fire watch). Fire watch protection will continue for 30 minutes after welding has been stopped to assess hazards and ensure that no flare-ups occur. Welding in confined spaces (review Section # 24 Confined Space Entry for additional information) or near flammables or combustibles requires that the area be monitored for atmospheric conditions before work begins and after each stop in work over 15 minutes, to ensure it is safe to strike an arc.
2. Since welders on heavy highway projects generally work alone, a tool box safety meeting must be conducted to warn other employee/owners assigned to the project to “not look at the welding arc flash” since a painful injury could result in a condition known as “Flash Burn”.
3. When welding or cutting lead, zinc, cadmium-coated, lead-bearing, or other materials containing or coated with toxic materials, provision must be made for the removal of fumes or the use of approved respirators. Contact your safety representative to assist with hazard evaluation and to recommend control methods.
4. When using an electrical handheld side grinder to bevel or clean pipe or other material in preparation for welding/cutting, the use of safety glasses and face shield to protect the eyes and face from flying particles as well as gloves to protect the hands is required. Wheels exceeding 2" in diameter require a safety guard.

### Protective Clothing

Protective clothing is required for any welding operations and may vary with the size, nature, and location of the work.

Protective measures for welders and helpers include:



- 
1. Natural fiber clothing (cotton or wool) may be worn on the upper body extremities. A leather apron, sleeve, or full body leather is recommended.
  2. Flame-resistant gauntlet gloves should be worn except where the welder is engaged in light work.
  3. Flame-resistant leather aprons or other suitable material as protection against radiated heat and sparks.
  4. Clothing should be free of oil and grease. Woolen clothing is not as readily ignited, as is untreated cotton. Welders or helpers may not wear double knits or nylon since both fabrics burn and melt easily.
  5. Pockets and cuffs provide locations for sparks to accumulate – which could lead to burns and blisters. Collars and cuffs must be buttoned and cuffs turned up inside pants. Pockets must be eliminated from the front of vests, shirts, and aprons or provided with buttoned flaps.
  6. Low-cut shoes with unprotected tops are not permitted.
  7. Fire-resistant capes and shoulder covers must be worn during overhead welding operations. Ear protection is recommended to prevent hot slag from entering the welder's **ears (never use cotton)**.
  8. Fire retardant clothing is recommended for welding operations generating large quantities of hot slag such as in gouging operations.
  9. Before commencing work, work specific and area hazards must be understood and communicated and appropriate hot work authorizations must be obtained. Specific approval must be obtained from the welder's supervisor before starting work and permission is only granted once the operating area and welding equipment have been checked out and found safe to proceed.
  10. Use barricades to prevent personnel from unknowingly entering welding/cutting areas of operation (areas subject to falling sparks and slag).



---

### **Welding Area Preparation (35 ft. area surrounding the work location)**

1. Flammable liquids, dust, lint, and oily deposits must be removed (combustible materials)
2. Explosive atmosphere must be eliminated and monitored
3. Floors must be swept clean
4. Combustibles in the area must be removed or covered with fire blankets and/or treated tarps
5. Welding/cutting operations should not be conducted over other personnel who may be subject to falling/flying sparks and hot slag
6. Fire watch personnel must be utilized whenever there is a potential for igniting combustible material such as weeds and brush and/or to prevent access to an area. The fire watch must remain in the area for 30 minutes after the welding operation is complete to detect delayed or smoldering ignition sources
7. Fire watch personnel must be trained in the use of the fire protection equipment provided
8. Hot Work may not be conducted in any area containing a potentially combustible or explosive atmosphere

### **Fire Prevention**

1. When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed and for a sufficient period after completion of work to ensure that no possibility for delayed combustion exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used.
2. Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.



---

## **Welder Flash Protection**

1. Welding and cutting operations give off arc flashes and rays that can damage the clear portion of the eye called the cornea and a painful situation called “flash burn” can result from unprotected exposures.
2. Welding screens can be used in designated fab areas and in non-construction facilities such as plants, equipment shops and storage areas, to protect other employee-owners working in the same general area from arc flashes.

## **Ventilation & Protection in Welding, Cutting & Heating**

1. Welding, cutting, and heating may normally be done without mechanical ventilation or respiratory protective equipment. However, when unusual physical or atmospheric conditions exist, an unsafe accumulation of contaminants could result requiring mechanical ventilation or respirator use. Check with your company safety representative if such situations are anticipated.
2. Employee-owners performing welding, cutting or heating shall be protected by suitable eye protective equipment.
3. Other employee-owners directly exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner. Welders and welders' helpers are to wear approved safety welding hoods or cutting goggles.
4. In confined spaces where welding, cutting, or heating metals that contain zinc, lead, cadmium, mercury, chromium, beryllium, or covered with preservative coatings, or working with inert gas arc welding is taking place, check with your safety representative concerning the recommended safe operating procedures, air sampling, and required control methods.

## **Arc Welding**

Welding Equipment:

1. Only standard electric arc welding equipment conforming to the requirements of the National Electrical Manufacturers Association or the Underwriters Laboratories, Inc., or both, shall be used.



2. Power circuits shall be installed and maintained per the National Electrical Code. Check to see if the welding machine's voltage matches the power supply.
3. Check the manufacturer's requirements for grounding the electric welding machine operated from power circuits.
4. Electrode and ground cables should be supported so as not to create obstructions interfering with the safe passage of workers. The ground lead for the welding circuit should be mechanically strong and electrically adequate for the service required. Grounding should be accomplished as close to the welding operation as possible.
5. An electrode holder of adequate rated current capacity, insulated against shock and shorting or flashing when laid on grounded material, shall be used
6. Adequate exhaust to the outside shall be provided where internal combustion engines are used to operate welding machines in enclosed spaces and the atmosphere must be tested for CO<sub>2</sub> to ensure adequate exhausting
7. Welders must wear combination safety hard hats and welding hoods with bill/beak/brim turned to the front
8. The proper shade of welding lens is required and an adequate supply of cover lenses shall be available. Personnel assisting operators should also wear protective lenses to avoid "welding flash" burns to the eyes.

### **Manual Electrode Holders**

1. The electrodes being used shall be of a capacity capable of safely handling the maximum rated current
2. They shall be fully insulated against the maximum voltage encountered to ground
3. No tape repair is allowed in the first 10 ft. of cable from the electrode holder (whip line) since that section could come into contact with the welder and create an adverse reaction from shock or burn if the cable were not properly insulated



---

## **Welding Cables and Connectors**

1. Arc-welding cables shall be of the completely insulated, flexible type capable of handling the maximum current requirements of the work in progress. When it becomes necessary to connect or splice lengths of cable one to another, they shall be securely fastened together to give good electrical contact, and the exposed metal parts shall be completely insulated.
2. Cables in poor repair shall not be used. If a cable becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tape or other equivalent insulation (friction tape is not allowed on the whip section of the welding cable).

## **Machine Grounding**

1. Machine grounding shall be carried out according to the manufacturer's specifications. Grounding equipment shall be the type and size specified by the manufacturer to ensure adequate grounding when required.

## **Operating Instructions**

1. When electrode holders are to be left unattended the electrode shall be removed and the holder shall be so placed or protected that they cannot make electrical contact with employee/owners or conducting objects. Electrodes left in the holders present an impalement hazard.
2. Hot electrode holders shall not be dipped in water
3. Any faulty or defective equipment shall be reported to the supervisor
4. Electrodes shall not be struck against a compressed gas cylinder to strike an arc.

## **Gas Welding and Cutting**

### **Storage of Compressed Gas Cylinders:**

1. Cylinders must be stored in designated places where they will not be damaged by passing or falling objects. Storage facilities must be designated as non-smoking areas and posted with the names of the gases to be stored. Outside storage of cylinders must be protected from adverse weather conditions. Carts are not to be used for storage. Gauges must be removed each night, and the





---

cylinders must be properly capped to protect the valve. If the cylinders will not be used for 24 hours they must be removed from the cart and properly stored or the cart must be equipped with an approved and rated divider.

2. Full, unused cylinders must be kept in a designated area, separate from the empty cylinder.
3. Oxygen and oxidizing gas cylinders must be stored separately from flammable-gas cylinders (i.e. Acetylene, Propane, etc.) or combustible materials (especially oil or grease) by a minimum distance of twenty feet or by a non-combustible barrier, at least five feet high, having a fire-resistance rating of at least one-half hour. This does not include oxy-acetylene carts since such carts are designed for actual use and not for storage.
4. Valve protection caps shall be in place and secured when the cylinder is not in use since the weakest part of the compressed gas cylinder is the valve
5. Compressed gas cylinders shall be secured in an upright position at all times, except if necessary for short periods while cylinders are actually being hoisted or carried.
6. Compressed gas cylinders must be identified by a legibly marked label or stencil rather than by color of cylinder. Cylinder color must not be relied upon for content identification. Department of Transportation (DOT) labels are required if transported on streets and highways.
7. Acetylene/Oxygen carts mounted in company pickups shall have the gauges removed and the valve protection caps put in place while traveling on public streets and highways (in case of auto accidents)
8. Do not accept for use any cylinder not identified by a legible label or stencil. Cylinders of this type must be tagged and returned to the supplier.

### **Transportation and Moving Compressed Gas Cylinders**

1. When cylinders are hoisted, they shall be secured on a cradle, nylon web sling, board, or pallet. They shall not be hoisted or transported by means of magnets or choker slings.



2. Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.
3. When cylinders are transported by power vehicles, they shall be secured in an upright position
4. Valve protection caps shall not be used for lifting cylinders from one vertical position to another
5. Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved
6. A suitable cylinder, truck/cart, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.

### **Placing Cylinders for Use**

1. Cylinders shall be kept away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them.
2. No cylinders will be taken into confined spaces since such gases can displace breathing air and suffocate personnel and could unknowingly leak into the confined space.

### **Treatment of Cylinders**

1. Cylinders, whether full or empty, shall not be used as rollers or supports.
2. No damaged or defective cylinder shall be used.

### **Hose**

1. Hoses used in carrying acetylene, oxygen, or any other gas or substance, that may ignite or enter into combustion or be harmful to employee-owners, must be inspected at the beginning of each working shift. Defective hoses must be removed from service.
2. Hose coupling must be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.
3. Boxes used for the storage of gas hoses must be ventilated.



- 
4. Hoses, cables, and other equipment must be kept clear of passageways, ladders, and stairs (tripping hazards).

### **Torches**

1. Clogged torch tip openings must be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.
2. Torches in use must be inspected at the beginning of each working shift for leaking cut-off valves, hose couplings, and tip connections. Defective torches may not be used.
3. Torches must be lit by friction lighters (strickers) or other approved devices and not by matches or cigarette lighters. The use of hot work as a means of lighting torches is not permitted.
4. Torches must be equipped with flashback arrestors (not check valves). Consult with the torch manufacturers regarding this issue and follow their recommendations.

### **Regulators and Gauges**

1. Oxygen and fuel gas pressure regulators, including their gauges, must be in proper working order while in use
2. Regulators and gauges must be kept free of grease and dirt at all times
3. Regulators with broken gauge glass, missing screws, etc. must be taken out of service and repaired or discarded
4. Regulators are to be equipped with built-in or external check valves (not flash back arresters) that prevents the mixing of gases in the gauges as a result of backpressure and faulty shut off valves. Check with the manufacturer before applying check valve devices.

### **Chipping, Cleaning & Grinding**

1. When removing excess weld metal, faulty welds, or slag, where the welder removes or raises his shield, safety glasses must be used. The chips flying from the cleaning/chipping hammer are dangerous, especially to the eyes.



- 
2. Gloves must be worn to protect the hands and wrists. Flying chips are liable to travel a considerable distance. The danger to other personnel in the area may require screening or shielding.
  3. Caution employee-owners to chip away from the face.
  4. Gloves must be worn when wire brushing welded metal.
  5. When cleaning and brushing surfaces to be welded, use caution to avoid metal slivers and sharp edges. Gauntlet gloves are advisable.



---

## 24. Electrical

### General Requirements

1. Only qualified personnel will be allowed to perform electrical work.
2. No AB&R employee-owner may work on energized (hot) electrical systems or equipment without proper training and qualifications. Such work will be contracted to a specialized company having the qualified personnel and necessary equipment to safely perform such work.

### Portable and/or Cord and Plug Connected Equipment

1. General:
  - The non-current carrying metal parts of portable and/or plug-connected equipment must be grounded
  - Portable tools and appliances protected by an approved system of double insulation may not be grounded. Where such an approved system is employed, the equipment must be identified by the manufacturer as double insulated and so designated on the tool itself.
  - GFCIs must be tested before use to ensure that they trip the circuit as specified by the manufacturer. GFCIs are required for temporary electrical service (120 volt, 15 or 20 amp service) including extension cords.

2. Fixed Equipment:

Exposed non-current carrying metal parts of fixed electrical equipment, including motors, generators, frames, and tracks of electrically operated cranes, electrically driven machinery, and similar equipment must be grounded according to the equipment manufacturer's specifications.

3. Portable Equipment:

- Extension cords used with portable electric tools and appliances must be of the three-wire industrial-rated type. Extension cords must be marked to indicate compliance with the Hard Service designation.



- 
- Extension cords may not be fastened with staples, hung from nails, or suspended by wire
  - Worn or frayed electric cables may not be used
  - Extension cords must be protected against accidental damage as may be caused by traffic, sharp corners or projections, and pinching in doors and under material or machinery
  - Internal insulation repairs may not be made. Destroy and replace any cords that have been cut or abraded.

### **Temporary Lighting**

1. Temporary lights must be equipped with guards to prevent accidental contact with bulb. Guards are not required when the construction of the reflector is such that the bulb is deeply recessed.
2. Temporary lights must be equipped with heavy-duty electric cords with connections and insulation maintained in safe condition. Temporary lights may not be suspended by their electrical cords unless cords and lights are designed for direct suspension.
3. Precautions must be taken to verify the location of underground or inner wall electrical interference before beginning excavation or penetration activities.

### **Ground Fault Protection**

Ground Fault Circuit Interrupters (GFCI) monitor the amperes between the hot and neutral conductors. When there is a difference of no more than 5 milliamps between the hot and neutral conductors, they are designed to trip the circuit and thereby afford protection downstream. GFCIs must be placed between the power supply and the employee-owner to afford protection. GFCIs must be tested before each use to ensure that they trip the circuit as designed by the manufacturer.

1. Ground fault protection is required on 120 volts, 15 and 20-ampere service, and single-phase receptacles that are not a part of the permanent wiring (non-permanent wiring includes the use of an extension cord). This can be accomplished by one of two methods; ground fault circuit interrupters (GFCIs)



---

installed in the temporary electrical system or use of approved portable GFCI units.

2. Ground fault protection is only as good as the equipment used. It is necessary to have the temporary and permanent wiring installed in accordance with the National Electrical Code including proper ground wires in circuits. Additionally, electrical power tools, outlets and extension cords must be inspected daily for damage to both the tool and the electrical cord.



---

## 25. Scaffolding and Aerial Lifts

### General Requirements

1. Scaffolds must be designed by a qualified person and must be constructed and loaded in accordance with that design. A qualified person is “one who by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project”.
2. Scaffolding must be erected, dismantled, moved, or modified under the direction of a competent person. A competent person as “one who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employee-owners, and who has authorization to take prompt corrective measures to eliminate them”.
3. The employer must designate each “qualified” or “competent” person based on their qualifications, abilities, and authority to take corrective actions. Attending a “training class” does not automatically qualify an individual as a competent person.
4. The scaffold (including components) must be inspected for visible defects by the appropriate, designated competent person before each work shift, and/or after any occurrence affecting the scaffold’s structural integrity with an appropriate tag attached reflecting status.
5. Any part of a scaffold damaged or weakened (affecting the structural integrity) must be immediately replaced or removed from service and repaired or discarded.
6. Scaffolds must not be moved horizontally while employee-owners are on them.
7. The clearance between scaffolds and power lines must never be less than 20 feet.
  - However, each situation must be evaluated by a competent person, and issues such as additional clearance needed for tools, material, and/or





---

equipment must be taken into consideration when evaluating safe working distances from power lines.

- The utility company, owning or operating the power line may be contacted to de-energize the lines, relocate the lines or to install protective coverings to prevent accidental contact with the lines.
  - A company safety representative must be consulted if the 20-ft. clearance cannot be maintained.
8. The use of shore or lean-to scaffolds is prohibited.
  9. Employee-owners are prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for the removal of such material.
  10. Where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or equivalent measures to control the loads must be used.
  11. Working from or on scaffolding during high winds and storms is prohibited unless the competent person has determined that it is safe for the employee-owners to be on the scaffolding.
  12. Scaffold frames do not provide an adequate attachment point for personal fall arrest systems. Fall prevention is provided by properly erected handrails. However, if it is necessary to work in positions that render the handrails ineffective, other methods will need to be employed - such as manlifts, providing appropriate attachment points for a fall arrest system, use of rolling scaffolds or similar alternatives.

---

## 26. Stairways and Ladders

### General Requirements

A stairway or ladder must be provided at access points where there is a break in elevation of 19" or more and no ramp, runway, embankment, or personnel hoist is provided. Ladders present one of the major hazards in construction work and improper use is the cause of many serious accidents. An analysis of accidents involving ladders revealed that there are four principal causes:

- Ascending or descending improperly
  - Failure to secure the ladder at the top or bottom
  - Structural failure of the ladder itself
  - Carrying objects in the hands while ascending or descending
1. Light-duty ladders must be capable of supporting at least four times their maximum intended load and certain specified heavy-duty ladders must be capable of supporting not less than 3.3 times their maximum intended load. Portable ladders must be at least 11 ½" wide, and rungs must be uniformly spaced 10" – 14" apart.
  2. The rungs and steps of fixed metal ladders must be corrugated, knurled, dimpled, coated with skid-resistant material or otherwise treated to minimize slipping.
  3. Step ladders and extension ladders should be Type 1 or Type 1A Fiberglass
  4. Job-built ladders must be built in accordance with the applicable ANSI standards (consult with the company safety representative regarding ANSI standards before constructing job-made ladders to ensure compliance).

### Ladders

Proper maintenance is vital to the life and safety of any ladder.

1. Inspection
  - Job-built wooden ladders must be inspected weekly for damage and deterioration. Close visual inspection is recommended in preference to load testing. Periodically the ladder must be inspected to be sure that

---

there are no loose rungs, there are no splits or severe damage to the side rails and that ladder is installed properly. Take the ladder out of service if damaged.

- The individual using the ladder must inspect it before each use. Parts must be checked for wear, corrosion, and structural failure. Be especially careful in inspecting fiberglass ladders and remove ladders with damaged rungs, damaged side rails, and missing or damaged feet. Make certain that the safety feet are in place and that they have not become loosened.

## 2. Maintenance

- Fiberglass ladder rungs must be cleaned to prevent the accumulation of materials that might destroy non-slipping properties and metal fittings should be carefully checked. A ladder with a badly bent rung must be removed from service.
- When not in use, ladders must be stored in accordance with the manufacturer's recommendations.

## 3. Training Requirements:

- A competent person must train employee-owners in proper ladder safety prior to ladder use. This training will be entered into HCSS.
- The correct procedures for erecting, maintaining and disassembling the fall protection system will also be addressed by the supervisor during the jobsite hazard analysis.
- The proper construction, use, placement and care in handling of stairways and ladders is a joint responsibility of supervision and employee-owners in conjunction with guidance from the appropriate safety representative.
- The maximum intended load-carrying capacities of ladders used will dictate ladder selection and use.
- Retraining must be provided for each employee-owner as necessary so that the employee-owner maintains the understanding and knowledge required.



---

Requirements for Ladder Use:

4. Fall protection & ladder use:

- Employee-owners who work on ladders and follow the procedures listed in this section are not required to use additional fall protection measures unless noted:
- Maintain at least three points of contact with the ladder at all times.
- Maintain the center of the body between the ladder's vertical supports while performing work on the ladder.
- Employee-owners on a ladder near a building edge or open hole require additional fall protection measures. If work is to be performed in these situations, consult with a company safety representative.

5. General Portable (stepladder) Requirements:

- A metal spreader/locking device of sufficient strength to securely hold both sides of the front and back sections open must be a working component of each stepladder. This locking device must be in the "locked position" whenever a stepladder is used. Do NOT use a stepladder in the "folded" position.
- The top two rungs of a ladder may not be used.
- Damaged ladders must be tagged as "Dangerous, Do Not Use" and be withdrawn from service. These ladders must be either repaired or destroyed to prevent use.
- Ladders must not be placed in front of doors opening toward the ladder unless door is blocked, open, locked and posted or guarded.
- Ladders must be equipped with non-slip bases/feet.
- Ascend/descend on the side of the ladder designed for such activity.
- Climber must face the ladder when ascending or descending.



- 
- Only one person on a step ladder at a time so that the ladder is not overloaded or subject to tilting.
  - When storing, ladders must be laid on their side, secured with a chain, cable or approved storage device or be stored upright. Improper storage can severely damage ladders.
  - Extension ladders must be adequately secured at the top or bottom to prevent slipping.
  - Manufacturer's labels must be on the side of the ladder.
  - Follow the 4:1 rule: The distance from the ladder's base to the vertical side of the support must be one-fourth of its working length.
  - Post and/or secure area near the base of the ladder with cones or barrier tape to keep area separate from other employee-owners when working on stepladders.
  - When tools or equipment cannot be carried in tool belts or bags, they must be handed up or down to different levels or lifted by rope or other acceptable means.
  - Ladder feet must be placed on a substantial, level base and the area in the vicinity of the legs will be kept clear of debris and afford a non-skid surface. The ladder must be secured to prevent displacement.
  - Ladders leading to landings or walkways must extend at least 36" above the landing and be securely fastened

**6. General Fixed Ladder Requirements:**

- Rungs shall have a minimum diameter of 3/4 inch.
- Distance between rungs shall not exceed 12 inches and shall be uniform throughout.
- Minimum length of run shall be 16 inches.
- The required clearance between the ladder and the nearest permanent object on the ascending/descending side of the ladder is 30 inches.

- 
- Seven inches of clearance is required between ladder rungs and nearest permanent object on the backside of the ladder to allow for enough room to properly grab the rungs and for proper foot placement.

## **Stairways**

The following general requirements apply to stairways used during construction:

1. Stairways that are not a permanent part of the structure, on which construction work is performed, must have landings at least 30 inches deep and 22 inches wide every 12 feet (or less) of vertical rise.
2. Stairways must be installed at an angle of at least 30 degrees, and no more than 50 degrees, from horizontal.
3. Variations in riser height or stair tread depth must not exceed 1/4 inch in any stairway system, including any foundation structure used as one or more treads of the stairs.
4. Where doors or gates open directly onto a stairway, a platform must be provided that is at least 20 inches in width beyond the swing of the door.
5. Stairway parts must be free of dangerous projections such as protruding nails.
6. Slippery conditions on stairways must be corrected.

## **Stair rails and Handrails**

The following general requirements apply to stair rails and handrails:

1. Stairways having four or more risers, or rising more than 30 inches in height, whichever is less, must have at least one handrail. A stair rail also must be installed along each unprotected side or edge. When the top edge of a stair rail system also serves as a handrail, the height of the top edge must not be more than 37 inches nor less than 36 inches from the upper surface of the stair rails to the surface of the tread.
2. Midrails, screens, mesh intermediate vertical members or equivalent intermediate structural members must be provided between the top rail and stairway steps of the stair rail system.



- 
3. Midrails, when used, must be located midway between the top of the stair rail system and the stairway steps.
  4. Screens or mesh, when used, must extend from the top rail to the stair rail step, and along the opening between top rail supports.
  5. Intermediate vertical members, such as balusters, when used, must not be more than 19 inches apart.
  6. Other intermediate structural members, when used, must be installed so that there are no openings of more than 19 inches in width.
  7. Handrails and the top of the stair rail systems must be capable of withstanding, without failure, at least 200 pounds of weight applied within two inches of the top edge in a downward or outward direction, at any point along the top edge.
  8. The height of handrails must not be more than 37 inches nor less than 30 inches from the upper surface of the tread.
  9. The height of the top edge of a stair rail system used as a handrail must not be more than 37 inches nor less than 36 inches from the upper surface of the stair rail system to the surface of the tread.
  10. Stair rail systems and handrails must be surfaced to prevent injuries such as punctures or lacerations and to keep clothing from snagging.
  11. Handrails must provide an adequate handhold for employee-owners to grasp to prevent falls.
  12. The ends of stair rail systems and handrails must be constructed to prevent dangerous projections such as rails protruding beyond the end posts of the system.
  13. Temporary handrails must have a minimum clearance of three inches between the handrail and walls, stair rail systems, and other objects.
  14. Unprotected sides and edges of stairway landings must be provided with standard 42-inch-high guardrail systems



---

## 27. Crane Hoisting Operation and Maintenance

### Policy

It is the policy of the company that cranes be operated and maintained in accordance with the manufacturer's published guidelines, nationally recognized applicable standards, regulations and Austin's accepted safe practices as outlined in company procedures and appendices.

### Responsibilities

#### ***Crane Superintendent***

The crane superintendent is responsible for the overall coordination of crane operators and equipment in close cooperation with project management staff to assure that all the field operations crane-hoisting needs are met in a timely and efficient manner. This person is also responsible for overall Operator compliance with policies, training, documentation and competency. The crane superintendent or his designee is responsible for the assessment and approval of all crane operators that they demonstrate their competency through completion of the *Crane Operator Proficiency Assurance Guide* outlined in this procedure. The crane superintendent maintains a current accessible list of authorized crane operators and manages the issuance of operator cards to the operators. The crane superintendent reports jointly to the Crane Department of the Equipment Division AND Operations. The crane superintendent assists with the solicitation of outside crane rentals, whether operated or not, and the recruiting of qualified operators, depending on availability and the needs of the project staff.

#### ***Project Senior Management***

The highest ranking, on-site, Project Supervisor is responsible for the implementation of this policy and procedures. Qualified supervision should be designated by the Project Supervisor to ensure that all crane operators have a copy of the crane operators rules, contained in this procedure (Appendix C), and that they possess a valid crane operator card issued by the crane superintendent. The Project supervisor shall assign a competent and qualified Lift Director, as further defined below, to approve lift plans.





---

Project Superintendent is responsible for identifying and ensure only qualified signal persons, riggers, and crane operators are utilized for crane operations.

### ***Assembly/Disassembly Director***

Assembly/Disassembly Directors (A/D Directors) are those individuals who have demonstrated that they are both competent and qualified for the particular assembly/disassembly activity in which they are supervising. It is the responsibility of the A/D Director to ensure that the assembly/disassembly of any crane is completed in full accordance with the manufacturer's requirements, those requirements.

### ***Lift Director***

Lift Directors are those individuals who have demonstrated that they are both competent and qualified to directly supervise critical lift operations. It is the responsibility of the Lift Director to ensure that company policy and procedures are followed and to correct any deviations from this procedure, unsafe employee-owner acts and/or unsafe equipment conditions. The Lift Director shall develop or review and approve all critical lift plans and then implement the approved plans during each critical lift operation.

### ***Operators***

Crane Operators are responsible for complying with the requirements outlined in this policy and procedure, as well as the manufacturers' operating recommendations. Crane Operators must do the following; conduct and document a daily inspection of their equipment, a monthly inspection of wire ropes, hooks, and block(s). Crane operators must determine if each situation classifies as a critical lift.

Crane operators are responsible for the review and acceptance of a critical lift plan prior to making a critical lift. Crane operators may assist the Lift Director in completing the critical lift plan. **Crane operators are responsible for knowing the weight of each load, understanding the published crane load charts, and complying with this policy, in full, at all times.**

**Crane Operators must be completely satisfied that all requirements are met and that the lifting operation can be completed safely. Therefore, the Crane Operator has the express authority not to perform the lift if he/she feels that it is unsafe. The lift will only be made after safety is assured, and if necessary, other**



---

**personnel with greater expertise and knowledge will be made available to conduct the lift.**

All crane operators under the current employment of the company must hold a valid operator's certification issued by a Third Party Accredited Testing Organization in addition to having an Austin Bridge & Road card for the type of crane being operated. Qualified Crane Operators must demonstrate competency with Austin's *Crane Operator Proficiency Assurance Examination* (Appendix D) including a field proficiency demonstration of their skills administered by the crane superintendent or his designee. Upon completion of this examination, the operator will be issued an annual crane operator card for the particular cranes or class of cranes to be operated. The card will be carried with them at all times.

### ***Qualified Rigger***

The Qualified Rigger has completed the Austin Bridge & Road sponsored rigger training course and has demonstrated that he/she meets the criteria of a qualified person for the work being performed. The Qualified Rigger is responsible for identifying those circumstances where the rigging is outside of his/her knowledge base or qualifications and should seek assistance from a more knowledgeable supervisor before proceeding with the rigging of such loads.

### ***Qualified Signalperson/Flagger***

The Qualified Signalperson/Flagger has successfully completed the Austin Bridge & Road sponsored signalperson/flagger training course and has demonstrated that he/she meets the criteria of a qualified Signal Person. The Qualified Signalperson is responsible for giving standard operator signals in the routing of the lifted load to the designated position in a safe and controlled manner.

### ***Engineering Department / Project Engineering***

Engineering is responsible for providing supervisors with engineering support, as requested, to aid in the planning and execution of critical lifts. This includes site visits, erection drawings, and design of rigging and special equipment. A licensed Professional Engineer (PE) may be designated as a qualified competent person if such an engineer is knowledgeable in the use of cranes and the requirements of this policy. Consult The



---

Austin Way, chapter 13 for a full discussion of what the Engineering Department should be consulted on in the development of critical lift plans.

### ***Safety Department***

The safety department is responsible for auditing and documenting compliance with this policy and procedures and for notification to the project supervisor of any deviations.

The safety department is responsible for the training, proficiency testing, and management of current documentation on all authorized qualified riggers and signalpersons/flaggers.

### **Assembly/Disassembly of Cranes**

Coordination of all assembly and disassembly including the addition of jib or boom and the reeving of blocks or balls will be through the Crane Superintendent. The Crane Superintendent will assign the appropriate available **Assembly/Disassembly Director (A/D Director) for the particular task.**

All assembly and disassembly will be under the direction or responsible charge of the assigned **A/D Director Superintendent** and following the manufacturer's recommendations.

No assembly/disassembly of cranes is allowed below power lines, within 20 feet of power lines rated up to 350 kV and within 50 feet of power lines over 350kV or as established by the utility owner.

No modifications are to be made to any crane or lifting equipment without the express written approval of the manufacturer or licensed Professional Engineer competent in the design of the applicable equipment.

Any repairs to the boom or other structural components are to be made by a third party repair facility where proper controls and documentation can be provided as approved by the Equipment Director. Repairs shall be made in accordance with the manufacturer's design/specifications.

The A/D Director is to conduct a full inspection of the crane upon completion of assembly or the changing of boom, jib or other reeving.



---

## Safety Devices and Operational Aids

Safety devices shall be in continuous working order. Cranes will be placed out of order, locked out and tagged out, until the safety devices are repaired. These include:

- Crane level indicator
- Boom stops
- Jib stops
- Locks for foot pedal brakes
- Horn

Operational Aids include the following as Category I operational aids:

- Boom hoist limiting device
- Luffing jib limiting device
- Anti-two block device

Operational Aids include the following as Category II operational aids:

- Boom angle or radius indicator
- Jib angle indicator
- Boom length indicator
- Load weighing and similar device

Both category I & II operation aids shall be in working condition unless under repairs and alternative measures as allowed. Any operational aid will be repaired within 7 calendar days after the deficiency occurs. However, if it is documented that the necessary parts have been ordered within 7 calendar days of the deficiency, the device must be repaired within 7 days of the receipt of the parts. Alternative measures will continue to be used throughout all operations until the operational aid is in proper working condition.



---

## **Swing Radius Protection**

Cranes equipped with a swinging upper section, such as crawler cranes and cherry pickers, shall have swing radius protection installed while the crane is operating. Swing radius protection may consist of temporary physical barricades or a permanently mounted rope or cable system that gives a warning to stay clear of the hazardous area.

Employee/Owners and others who may be working near the crane must be trained as to the meaning of the warning system used and when it may be safe to enter the area protected by the warning system. Never enter the protected area unless you have the attention of the operator and the operator has stopped operating the crane. A flagman may be used when necessary to keep others clear of the hazardous area or when it is impractical to use a swing radius protection system - such as walking the crane or working in confined areas.

When working in close quarters, a flagman or barricade shall be stationed at the rear of crane to prevent anyone from being caught between the swinging counter-weight and other obstructions, such as handrails, walls, etc.

## **Cable Inspection and Replacement**

The inspection and replacement criteria for standing and running cable is further defined in Appendix E (Crane Inspection Program) of this policy. Running wire rope (cable) is defined as any cable running through sheaves and subject to flex when pulled through the sheaves in the operation of the crane. This can include a boom hoist as well as a load hoisting cable. Standing wire rope is usually in reference to lattice boom pendant lines from the boom tip to the high mast which do not run through any sheaves and are static in their use relative to the crane.

In addition to the normal replacement criteria relating to measurable wear and damage, Austin has elected to include further replacement criteria to address the age of the wire rope. Wire rope for load hoisting lines will be replaced at or before 2000 hours of drum rotation time. Wire rope for boom hoisting lines will be replaced at or before 1000 hours of boom hoist drum rotation time. No running wire rope shall be allowed to remain in service longer than four (4) years.



---

## **Load Blocks & Rigging**

Load blocks, headache balls, hooks and wire ropes shall be rated to handle the load being lifted and meet manufacturers' requirements for size and type for each crane. Slings, spreader bars, and other rigging shall be rated to safely lift the load. Chain and/or chain slings shall not be used for lifting without the prior approval of the Safety Director (exception: Mechanic truck hoists are allowed to use chains that have properly been inspected prior to use). Wire rope and wire rope accessories used for lifting shall be American made and come from a reputable supplier and manufacturer. Gunnebo-Johnson style hooks are recommended for use on company owned overhaul balls and on rented equipment when the application requires such a hook. Where wedge sockets are used on company owned equipment, "terminator" style wedge sockets are required. Each block, shackle or other rigging component must have a method in place to identify the weight and capacity of the device. It must have a clear weight permanently affixed to the object or a tag must be attached to provide this information.

## **Equipment Inspection**

### ***Annual Inspection Reports***

All cranes, both company owned/rented and subcontract, must have available for verification, a copy of the latest annual inspection report and a current annual inspection window decal before it can be placed in service. The crane superintendent will coordinate appropriate qualified crane inspectors to perform this operation for company owned cranes in coordination with the project.

### ***Special Inspections of Cranes***

In the event that a crane is involved in an accident where the lifted load is dropped, either by that crane or other crane(s) associated with that load, that crane will be placed out of service until a thorough inspection can be made by certified crane inspector. Likewise, should a crane be involved in an accident during transportation or any other event where damage to any part of the crane is suspected, that crane will be placed out of service until a thorough inspection can be made by a certified crane inspector. Such crane(s) will not be released back into service except by permission of the crane superintendent after receiving and reviewing the results of the crane inspection.



---

Equipment that has had a repair or adjustment that relates to safe operation must be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use.

Equipment that has been idle for 3 months or more must be inspected by a qualified person.

### ***Documentation***

Each project or job site shall establish a record filing system for maintaining the necessary documentation of crane inspection records. When a project is completed, crane inspection record files are to be sent to the crane department for incorporation into a consolidated file system. Records may also be maintained at a central location by the crane department in the absence of a job site record/filing system.

Proper manuals, charts, documentation, etc., shall be maintained on each machine. The Equipment Department will furnish this information with each machine and shall also include inspection forms.

### **Shipping and Receiving Inspection Reports**

Any crane operated by an Austin employee-owner that is owned, rented, loaned, or leased, on any Austin Bridge & Road job site shall be thoroughly inspected upon arrival at the job site and prior to disassembly for shipping to verify that the equipment is in safe operating condition and that it meets Austin Bridge & Road standard requirements. A copy of the latest annual crane inspection report should be available for review during this inspection. (See Shipping/Receiving Report, Appendix G)

### ***Responsibility***

The designated A/D Director is responsible for completing the inspection and documenting the inspection along with acceptance or rejection of the equipment.

### ***Documentation***

A copy of the Shipping/Receiving Report shall be filed with the job site equipment files and with the equipment department.



---

## **Crane Operator Qualification**

### ***Physical Requirements***

Operators must pass an annual physical evaluation.

1. Vision of at least 20/30 Snellen in one eye and 20/50 in the other, with or without corrective lenses.
2. Ability to distinguish colors, regardless of position, if color differentiation is required for operation.
3. Adequate hearing, with or without hearing aid, for all specific operations.
4. Sufficient strength, endurance, agility, coordination, and speed of reaction to meet the demands of equipment operation.
5. Operators and operator trainees should have normal depth perception, field of vision, reaction time, manual dexterity, coordination, and no tendencies to dizziness or similar undesirable characteristics.
6. Evidence of physical defects or emotional instability which could render a hazard to the operator or others, or which in the opinion of the examiner could interfere with the operator's performance, may be sufficient cause for disqualification. In such cases, specialized clinical or medical judgments and tests may be required.
7. Evidence that an operator is subject to seizures or loss of physical control shall be sufficient reason for disqualification. Specialized medical tests may be required to determine these conditions.

### ***Proficiency Assurance***

All operators must pass a written and practical operator's proficiency examination to determine his/her operating competency, regardless of experience. The appropriately signed form will be maintained in company files.

The written examination (test) is administered by the employment office or designated person which is then provided to the crane superintendent for approval before offering any person employment as a Crane Operator.

Copy of the Crane Operator Guidelines is to be given to crane operators (Appendix C).





---

The Crane Operator Proficiency Assurance Examination (Appendix D) will be used to determine the operators' competency and will be completed for operators by the crane superintendent or his/her designee regardless of experience.

Copies of the Appendices A thru G are maintained electrically for supervisors involved with crane operations.

## **Critical Lifts**

### ***Definition***

Any lift by crane where one or more of the following conditions exists, shall be classified as a Critical Lift, and a Critical Lift Plan (CLP) shall be generated and/or approved by the Lift Director

- The weight of the load is greater than 75 percent of the rated capacity at the planned maximum operating radius.
- More than one crane is being used to complete the lift.
- The weight of the load is 50 tons or more.
- Damage to the load would significantly affect the work schedule.
- The lift will be over or within 20 feet of energized power lines less than 350kV
- The lift will be over or within 50 feet of energized power lines greater than 350kV.
- The lift involves the use of a personnel basket.
- Any non-routine rigging or operational procedures are to be used.
- The customer, engineer, lift director, or other supervisor deems the lift as critical.

### ***Critical Lifting Plan***

If one or more of the preceding criteria are met, the lift shall be classified as a Critical Lift, and a Critical Lift Plan shall be prepared under the direction of the Lift Director. The Operator and Qualified Rigger shall assist the Lift Director in the preparation of the document. A completed CLP will be submitted to the safety department a minimum 7 days before commencement of the critical lift and shall be approved by the Safety Director or his designee. The Critical Lift Plan will be reviewed by the Lift Director prior to implementation. The Critical Lift Plan shall include each of the following:



1. Identify the Lift Director. The Lift Director bears the responsibility of the entire lifting operation. The Lift Director shall also be the signalman when more than one crane is being used to complete a lift and he/she has met the requirements of the Qualified Signalman.
2. Assign specific responsibilities to each worker involved in the lift, and ensure that each worker has sufficient experience and knowledge of the responsibilities assigned to him/her.
3. Indicate the form of communication to be used AND identify the Qualified Signalman. With the exception of emergency stops, the crane operator shall follow directions provided only by the designated signalperson(s). More than one signal person is permissible ONLY when a specified "hand-off" of the load is required to place the load. The signalperson shall always have a means of communication with the operator (i.e. if hand signals are being used, the operator must be able to see the signalperson at all times. If radios are being used, the operator(s) must be able to hear the signalperson/other operator at all times.). For multiple crane lifts, radios to communicate to the Operator shall be considered in lift planning, and only one signalperson will be used at a time.
4. Identify the load, and include dimensions, weight, location of center of gravity, susceptibility of change in center of gravity, pick point locations, tagline requirements, and presence, if any, of hazardous materials.
5. Identify crane(s) to be used including manufacturer, model, rated capacity, boom length, configuration size, and parts of line, jib, and additional attachments such as anemometer, LMI, or boom angle indicator. Cranes working secured on barges must be equipped with anemometers.
6. Identify the rigging equipment to be used. Include arrangement, size and number of slings, length and capacity of each sling(s), shackle and any other below-the-block lifting devices to be used.
7. Calculate the total theoretical load, including the load itself and an additional 10% unless the actual weight can be verified by reliable documentation, the weight of the hook, block lines, rigging, and anything else attached below the tip of the



---

boom. Based on the total theoretical load and the crane configuration-specific load charts, determine the maximum allowable radius/angle of operation. DO NOT INTERPOLATE BETWEEN EACH RADIUS, ALWAYS USE THE MORE CONSERVATIVE (SHORTER) RADIUS AS THE MAXIMUM ALLOWED DURING THE LIFT.

8. Produce a Job Hazard Analysis (JHA). The JHA shall identify both existing and potential hazards involved in the lift and the potential result of not avoiding the hazard. With each existing/potential hazard, instructions to avoid the hazard will be identified, and instructions will be identified regarding response if the hazard is not avoided (i.e., Here is the hazard, do this to avoid it, but if we do not avoid it, this is what you do to correct it.) The JHA should include rigging failures, possible collisions, load upsetting, crane support conditions (i.e., soil/crane mats), nearby electrical hazards, prior excavated areas, maximum allowable crane capacity within the operating radius, supplemental lighting requirements (i.e., night picks), load placement over workers/public, and crane inspection/maintenance.
9. The plan will include maximum allowable wind speeds.
10. Generate a Critical Lift Diagram (hand or CAD drawing) as applicable and in sufficient detail for the planned operation that includes crane placements, configurations, boom paths, load paths, tracking paths, potential hazard and/or obstruction locations, load origin, intermediate and final load locations, load weight, maximum boom radius/angle, minimum boom clearances, and all other necessary restrictions as appropriate. All multiple crane lifts require a critical lift diagram.
11. Clearly mark on the ground (so the operator[s] can see) the location(s) of the crane(s). If the lift involves tracking the crane to place the load, the tracking path shall be surveyed and clearly marked with flagging and/or fluorescent paint. Tracking movements, including sequence of movements, timing, and synchronization of movements shall be practiced by performing dry runs of the lift without the actual load.



- 
12. The lift director shall ensure that he (and the rigging foreman) has (have) prepared and inspected the rigging equipment to be used. The lift director (and the operator) shall also ensure that the crane has been properly inspected and maintained. Current required inspection/certification document shall become part of the CLP. The lift director shall ensure that the landing zone of the load is prepared to accept the load.
  13. The CLP shall require a pre-lift meeting with workers involved in the lift. In the meeting, review the entire lift plan, assign responsibilities (riggers, flaggers, operators, etc.), and clearly indicate the lines of communication. For dual crane lifts, the operators and lift director shall discuss procedures for working the load and where the load is to be maintained.
  14. At the discretion of the Lift Director, after the pre-lift meeting, perform an appropriate number of dry runs with everything and everyone to be involved in the lift (without the actual load). During the dry-runs, check for potentially destabilizing support conditions, lighting placement, personnel placement, communications, crane/boom/load movements, speed and timing of movements, and check for other potential unforeseen hazards.
  15. Communicate in the pre-lift meeting that; if at any time during the lift, the pre-planned conditions have changed or calculations need to be modified, stop the lift, secure the load, identify the cause of the change in conditions, rectify the problem and inform all involved workers before resuming lifting operations.
  16. Complete a Critical Lift Checklist to be used prior to and during the lift.

### ***Critical Lift Guidelines***

The following guidelines should be followed where appropriate as determined by the Lift Director in conjunction with the above for planning a critical lift and for execution of the lift:

1. **DETERMINING THE LOAD TO BE LIFTED.** The Lift Director is responsible for determining the ultimate weight of the item to be lifted and the amount of load each crane is required to lift. The use of calibrated and properly functioning Load Moment Indicators (LMI) is strongly recommended. Since exact weights are often



---

not known, the use of a properly functioning LMI should be employed during initial lifting to verify the load on the crane. If the load exceeds that established by the lift plan, the entire operation is to be stopped and a final determination relative to 90 percent capacity determined. Ideally, early communication from the plant/mill will allow the actual weight of beams, girders and other prefabricated loads to be determined prior to shipping.

2. **SUFFICIENT RIGGING FOR THE LOAD TO BE LIFTED.** Based on the anticipated weight of the load, every component of the rigging shall have sufficient capacity to connect the load to the hook of the crane. Documentation should include the capacity of each shackle, clevis, sling and any other device used in the rigging operation. Each sling shall have a tag identifying the length, capacity and size of the sling. The total weight of the rigging should be determined, as well as the weight of the load block and weight of the parts of line based on the anticipated length. This information is used to determine the final load that each crane is to pick.
3. **SELECTING THE APPROPRIATE CRANE.** Based on the site conditions, rigging weight and weight of the load plus an additional 10% unless the actual weight can be verified by reliable documentation, a crane selection and boom configuration are established that does not create a loading in excess of 90 percent of the allowable load charts for that configuration. Interpolation of the load charts is not permitted and no lift exceeding 90% of the applicable load chart of any crane will be allowed without VP approval
4. **JOB HAZARD ANALYSIS (JHA).** During the preparation of the JHA, inspect the site for all potential hazards that could affect the lift. Note the location of all overhead power lines, previous excavations and obstructions to the travel and swing paths, as well as levelness of the terrain. Any hazards that exist should be discussed with the entire lift team in order for a plan to be formulated. If overhead power lines are in close proximity to the lift, refer to the specific requirements of Power Line Safety contained within the Austin policy. Placement and escape routes of personnel during the operation are to be addressed in the JHA. In the case of night operations, the placement of supplemental lighting shall be



---

addressed so that the lighting does not interfere with operator or signalman sight during the lifting procedure.

5. **BOOM CLEARANCES DURING THE LIFT.** Ensure that the boom will have sufficient clearance not to affect any object during lifting, lowering, or traveling operations. Inadvertent boom contact can cause the boom to collapse.
6. **SOIL/SITE CONDITIONS.** Bearing capacities of the ground to be used by the cranes are to be known through verification, by soil borings, other work in that immediate area, confirmation through dry run exercises or other means to reasonably assure adequate support for the work to be performed. A generally conservative assumption in the absence of better information is that the bearing capacity is limited to 1 Ton/SF. The compaction of previously disturbed ground is to be monitored and assured prior to use by crane tracks or outriggers. The terrain that is to support the crane(s) shall be examined for levelness that will conform to the requirements of the crane manufacturer. As a rule, the crane(s) are to be leveled in all directions within 1% or 0.1 feet in 10 feet at all times whether stationary or moving with the suspended load.
7. **COMPLETING THE CRITICAL LIFT PLAN.** The plan should include sufficient drawings as applicable of the site with crane locations - from delivery point or staging of the load until placement, including travel. The plan shall also include the location of the load pick point(s) and the rigging diagram as necessary. The load radius from the center pin and boom length used for the lift along with the most extreme boom angle and maximum radius for the lift shall be clearly shown on the lift plan. Side elevations shall also be considered where necessary to document boom proximity evaluation with stated limits (dimensions) that the boom can come within any obstruction. A procedure shall be in place that outlines what each operator is to do to stabilize the load should the load become unstable or there is a requirement to stop the lift.
8. **COMMUNICATIONS.** Direct communications allow the operators to confer directly with each other and the lift director concerning status of the lift and potential hazards or changes in the plan. Radio communications should be considered between the operators and lift director in two or multiple crane lifts.



---

Voice activated radios are preferred to minimize any potential delays in communication.

9. **PRE-LIFT MEETING.** In the pre-lift meeting parties involved in the lift, discuss the plan, including location of personnel, percent capacity of the cranes, travel survey, communication and rigging. The duties and responsibilities of each worker in the lift are discussed along with the positioning during the lift. The operator(s) discuss how they intend to handle the load and what points are critical, relative to swinging and booming the load while the other crane is attached. In two crane picks, such movement can adversely affect the other crane and discussions must be held on procedure(s) to follow and maneuvers to avoid. The meeting can be followed by several dry runs by the operators, signalman, spotters, and lift director, (without load) to establish the speeds and timing of the travel. This is particularly important when conducting critical lifts at night. Lighting issues become paramount to the overall safety of the lift when performed at night with artificial lighting. Loads should be kept close the ground or supporting structure when traveling with a suspended load.
10. **SIGNING THE PLAN.** Following completion of the pre-lift meeting, lift director, rigging foreman and crane operators sign off on the plan to acknowledge their understanding and agreement with the procedures.
11. **PROPER WEATHER CONDITIONS.** Consult available weather forecasts as close to the time of the lift as is practical to limit exposure to inclement weather or high winds.

### **Crane Signals**

A single designated Qualified Signalperson is to give all signals to the crane operator for a particular lift unless other Qualified Signalpersons are required to “hand-off” the load due to project site conditions. Industry standard hand signals as shown in Appendix A will be used unless other signals are agreed to in advance of the lift by both the signalperson and the operator. If hand signals vary from the standards, this shall be discussed and agreed to before each lift.



---

## **Personnel Basket - Work Platforms**

Cranes used for lifting people in man baskets/work platforms shall comply with Austin's policies and procedures. See Austin Bridge & Road Safety Manual, Section 36: Crane Hoisted Personnel Baskets

## **Dedicated Pile Driving Operations**

When cranes are configured for the driving of piles with either vibratory or impact hammers, it may be designated as a "designated pile driver" and the anti-two block, LMI and other computer controls may be disconnected or disabled. Designation as a dedicated pile driver for a particular crane requires the prior approval of both the crane superintendent and the Area Manager.

Cranes designated for this purpose may not be used for any other operation without reconnection of disabled electronics and notification to both the crane superintendent and Area Manager that the crane is no longer working as a dedicated pile driver machine.

## **Power Line Safety**

No crane may be assembled or operated such that the boom or any load that will be suspended from the crane could be closer than 20 feet to an overhead power line rated at 350kV or less. Nor closer than 50 feet to a power line rated over 350kV without the prior approval of the Safety Director.

Prior to beginning any lifting operations within 50 feet of an existing overhead power line, the utility owner is to be contacted to determine and confirm the maximum current rating of the power line. Documentation of this assessment is to be made available to the project Lift Director(s) and Operator(s).

It is preferable to de-energize and visibly ground existing power lines before working near them. De-energizing and grounding does not relieve the E-O from obtaining approval of the Safety Director for working closer than 50 feet of an existing overhead power line. All power lines are assumed to be energized unless confirmed otherwise by utility and it is visibly grounded such that it cannot be re-energized.

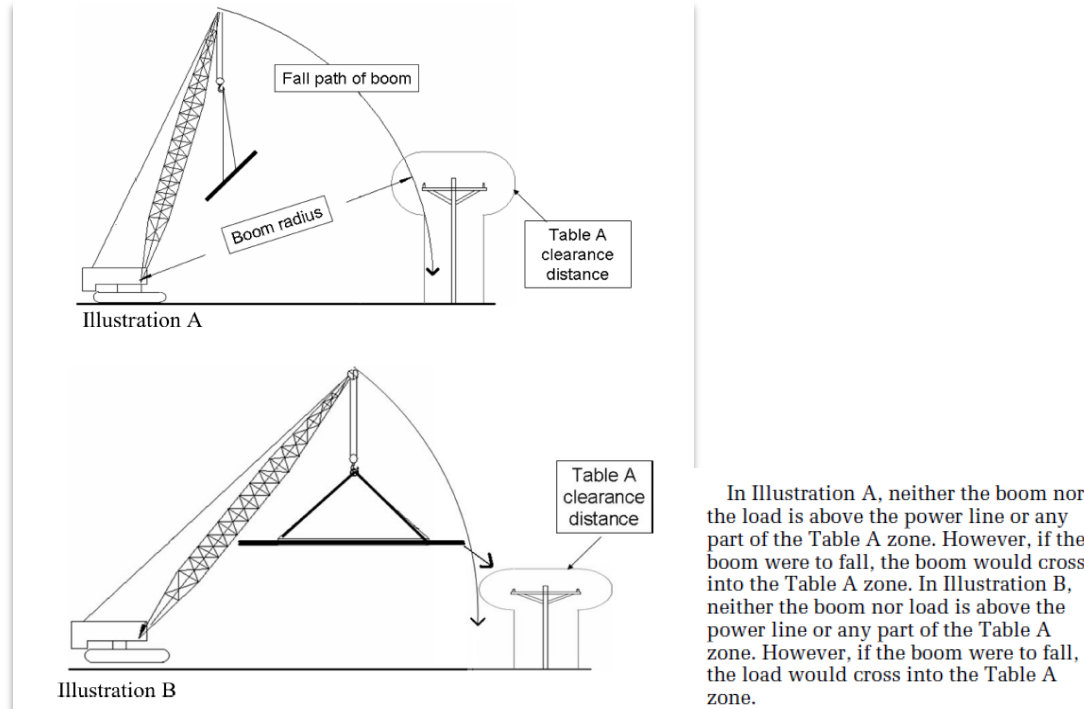
Prior to approaching overhead power lines with any crane, the area delineating the work area of the crane is to be physically marked and a determination made as to whether



the crane, boom or load could possibly encroach upon the 20 foot or 50 foot limitations. I.E.: where the crane boom would encroach upon the clearance to the power lines if it fell (including load)

**Figure 1**

*Crane Boom Encroaching on Powerlines*



Should it be necessary to operate the crane such that any part of the crane or load could potentially encroach upon the limitations set above and upon approval of the Area Manager and Safety Director. A plan shall be developed requiring complete compliance as applicable in order to secure the necessary permit from the Director of Safety or designee. Each plan shall include the establishment of an elevated warning line and a dedicated spotter if the operator cannot see the warning line.

**Moving Cranes on the Project**

Moving cranes on the project/job site will be done safely by providing drivers/operators with a flagman or spotter to safely guide them to their ultimate destination when conditions warrant. This does not apply to cranes mounted on boom trucks, mechanics trucks, or cranes designed for on-road travel that are traveling off-site.



---

The minimum clearance distances contained in OSHA 29 CFR 1926.1411 Table T shall be complied with at all times.

***Duties of Flagman or Spotter while moving cranes under power lines***

Employee-owners assigned the duties of flagman or spotter will:

1. Consult with the operator/driver to confirm route of travel and type of acceptable signaling or communication methods. That is, lights, flags, hand signals, and/or radio communications.
2. Review and verify that site conditions and route is safe to travel. Conditions to consider include but are not limited to the following: overhead obstructions (electrical or other utility as well as structures, etc.) and clearance, width of roads and curves (turning points), traffic congestion, underground voids or utilities, ground terrain conditions – softness, wet, potholes, evenness, and swing radius space.
3. Notify the operator/driver and supervisor of any unsafe conditions with equipment or route of travel.
4. Wear safety vest while guiding equipment and/or driver operator.
5. Take necessary action to stop or not allow equipment to travel if hazards are noted or appear and conditions are not safe.

Flagman or spotters shall be competent and selection shall be based on their prior experience and knowledge of moving cranes in and around construction sites, and the hazards inherent with these moves.

**Cranes on Barges**

Cranes mounted on floating barges shall comply with Austin's policies and procedures contained in Section 6 of the Austin Safety Policy and Procedures Manual.



## Reference

### APPENDICES

Appendices A-G are included as part of the Policy and Procedure

APPENDIX A – GENERAL OPERATIONAL GUIDELINES

APPENDIX B – GUIDELINES FOR SUPERVISORS

APPENDIX C – CRANE OPERATOR GUIDELINES

APPENDIX D – CRANE OPERATOR PROFICIENCY ASSURANCE EXAMINATION

APPENDIX E – CRANE INSPECTION PROGRAM

APPENDIX F – FORMS

APPENDIX G – CLP

APPENDIX H – OUTLINE OF OSHA 29CFR 1926 SUBPART CC



---

## 28. Motor Vehicle and Mechanized Equipment

### General Requirements

1. Equipment left unattended at night adjacent to a highway in normal use or adjacent to construction areas where work is in progress must have appropriate lights, reflectors or barricades to identify the location of the equipment.
2. Keys must be removed from equipment that is left unattended after work hours.
3. Motor vehicles, as covered by this section, are those vehicles that operate on the job site and do not travel on public roads. These requirements do not apply to crawler machines.
4. Personnel are not to congregate between heavy equipment and must stand clear once they have dismounted their heavy equipment. Personnel are to stay well away from haul roads and areas where heavy construction equipment is operating.
5. Heavy machinery, equipment, or parts there of which are suspended or held aloft by the use of slings, hoists, or jacks must be substantially blocked or cribbed to prevent sliding or shifting. Bulldozers, scraper blades, loader buckets, dump bodies, and similar equipment must be either fully lowered or blocked when being repaired or when not in use. Controls must be in a neutral position with the motor stopped, and brakes set, unless work being performed requires otherwise.
6. Equipment must be parked with parking brakes set. The controls must be set according to the manufacturer's recommendations.
7. Cab glass must be safety glass or equivalent that introduces no visible distortion affecting the safe operation of any machine. Cracked and broken glass must be replaced.
8. Roll cages must be in place as provided by the manufacturer and properly labeled.
9. Rollover Protective Structures (ROPS)
  - a. Equipment specifically included:



- 
- i) Crawler and rubber-tire tractors including dozers, excavators, push and pull tractors, winch tractors, and mowers.
  - ii) Off- the- highway self-propelled pneumatic-tire earthmovers such as trucks, pans, scrapers, bottom dumps and end dumps.
  - iii) Motor graders.
  - iv) Other self-propelled construction equipment such as front –end loaders, backhoes, rollers, and extendable boom forklifts and compactors.
  - v) Rough Terrain Cranes.
  - vi) Personnel moving equipment such as utility vehicles (Gators and Mules) that are not designed to be operated on public highways.
- b. Equipment Excluded:
- i) Truck designs for hauling on public highways
  - ii) Truck cranes and crawler cranes
  - iii) Sections of rollers and compactors that do not have an operator station
  - iv) Asphalt and concrete paving machines operated solely on flat terrain not exposed to rollover hazards

**All types of earthwork and material handling equipment must be equipped with seat belts or ROPS.**

1. Seat belts must be in place as provided by the manufacturer and worn when equipment is operated.
2. Lights, horns and safety equipment must work as designed.
3. Appropriate operator access and egress must be provided and maintained. Cable-suspended steps must be repaired/replaced when the cable becomes severely distorted or bent into a position that prevents intended access and/or egress from the operator's cab.



- 
4. Manufacturer operating/maintenance manuals must be available to the operator and mechanics that service the equipment.
  5. Vehicles must have a service brake system, an emergency brake system, and a parking brake system, and they must be maintained in operable condition.
  6. Whenever visibility conditions warrant additional light, vehicles or a combination of vehicles in use must be equipped with at least two headlights and two taillights in operable condition.
  7. Vehicles or a combination of vehicles must have brake lights in operable condition regardless of light condition.
  8. The use of any motor vehicular equipment having an obstructed rear window or view may not be used unless
    - a. The vehicle has a reverse signal alarm audible above the surrounding noise level.
    - b. If the reverse signal alarm is inoperable, the vehicle is backed only when an observer signals that it is safe to do so.
  9. Vehicles with cabs must be equipped with windshields and power wipers. Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields must be equipped with operable defogging or defrosting devices.
  10. Haulage vehicles whose load is loaded by means of cranes, power shovels, loaders, or similar equipment must have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.
  11. Tools and materials must be secured to prevent movement when transported in the same compartment with employee-owners.
  12. Vehicles used to transport employee-owners must have seats firmly secured and adequate for the number of employee-owners to be carried. Seat belts and anchorage must be installed in motor vehicles for the operator and employee-owners who ride in the vehicle. Seatbelts must be properly worn whenever the vehicle is in motion.



- 
13. Trucks with dump bodies must be equipped with a positive means of support, permanently attached, capable of being locked into position to prevent accidental lowering of the body while maintenance or inspection work is being done.
  14. Operating levers controlling hoisting or dumping devices on haulage bodies must be equipped with a latch or other device, which will prevent accidental starting or tripping of the mechanism.
  15. Trip handles for tail gates of dump trucks must be designed so that when dumping material, the operator will be in the clear.
  16. Rubber-tired motor vehicles must be equipped with fenders.
  17. Vehicles in use must be checked at the beginning of each shift to ensure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use:
    - a. Service brakes, including trailer and brake connections
    - b. Parking system (hand brake)
    - c. Emergency stopping system (brakes)
    - d. Tires (condition and inflation)
    - e. Horn, and lights
    - f. Steering mechanism
    - g. Coupling devices
    - h. Seat belts and other safety devices
    - i. Glass (clean, no breakage)
    - j. Fire extinguisher
    - k. Any other piece or requirement specified by the manufacturer in their operating/maintenance manuals
  18. Defects must be corrected before the vehicle is placed in service
  19. Refer to section 22 of this manual for requirements associated with Signaling and Barricading that apply to crane and heavy equipment operation.



---

## **Golf Carts, ATV's and UTV's**

1. Golf Carts, ATV's and UTV's must be equipped with lights to aid in their use in times of darkness.
2. Golf Carts, ATV's and UTV's must be equipped with operable horns and back-up alarms as warning devices.
3. Golf Carts, ATV's and UTV's are to be equipped with orange warning whip flags to ensure visibility.
4. Golf Carts, ATV's and UTV's must be equipped with a slow vehicle triangle mounted on the rear.

## **Earth Moving Equipment**

These rules apply to the following type of Earth moving equipment: scrapers, loaders, crawlers or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment.

1. **Seat Belts**
  - a. Seat belts must be provided on equipment covered by this section, except as listed below.
  - b. Seat belts may not be provided for equipment, which is designed for only stand-up. operation
  - c. Seat belts may not be provided for equipment that does not have rollover protective structure or adequate canopy protection that is not provided or required by the manufacturer.
2. **Haul Roads**
  - a. Roadway grades for construction equipment use must be designed by a competent person and constructed to accommodate the equipment using the roadway. Emergency access ramps and berms must be constructed to restrain and control runaway vehicles when deemed necessary by engineering/design.
  - b. Haul roads must be graded on regular basis to remove excess material or sludge after rain or excess watering.





---

**3. Brakes**

- a. Earth-moving equipment must have a service braking system capable of stopping and holding the equipment fully loaded.

**4. Roll Over Protective Structures (ROPS)**

- a. The following equipment, manufactured after July 1, 1969, must be fitted with ROPS: Rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler type loaders, and motor graders, with or without attachments, that are used in construction work.
- b. ROPS removed for any reason must be remounted with equal quality as required for the original mounting by the manufacturer.
- c. Each ROPS must have the following information permanently affixed to the structure:
  - i) Manufacturer or fabricator's name and address
  - ii) ROPS model number, if any
  - iii) Machine make, model, or series number that the structure is designed to fit

**5. Audible Alarms**

Bi-directional machines, such as rollers, compactors, front-end loaders, bulldozers, and similar equipment, must be equipped with a horn, distinguishable from the surrounding noise level, which must operate as needed when the machine is moving in either direction. The horn must be maintained in an operable condition.

**Pile Driving Equipment**

- 1. Overhead protection, which will not obscure the vision of the operator, shall be provided.
- 2. Stop blocks must be provided for the leads to prevent the hammer from being raised against the head block.



- 
3. A blocking device capable of safely supporting the weight of the hammer will be provided for placement in the leads under the hammer while employee-owners are working under the hammer.
  4. Guards will be provided across the top of the headblock to prevent the cable from jumping out of the sheaves.
  5. When the leads must be inclined in the driving of batter piles, provisions will be made to stabilize the leads.
  6. Fixed leads will be provided with a ladder and adequate attachment rings or similar attachment points so that the worker or pile buck can safely engage his/her safety harness lanyard to the leads. If the leads are provided with a loft platform, the platform must have standard guardrails to prevent falls.
  7. Air hammer hose shall be provided with the same protection as required for steam lines.
  8. Safety chains or equivalent means shall be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.
  9. Guys, outriggers, thrust outs or counterbalances shall be provided as necessary to maintain the stability of the pile-driving rig.
  10. Signals will only be given to the operator by a designated signalperson.
  11. Employee-owners will stand clear while piling is being hoisted into the leads.
  12. When piles are being driven in an excavated pit, the pit walls will be properly sloped, or sheet piled and braced.
  13. When steel tube piles are being "blown out" employee-owners shall be kept well beyond the range of falling materials.
  14. When it is necessary to cut off the tops of driven piles, pile driving operations shall be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.



- 
15. When jacking piles, access pits shall be provided with at least two ladders and bullhead curbs to prevent material from falling into the pit.
  16. The manufacturer's maintenance and operational requirements will be followed.

### **Traffic Procedures**

Cars, Pickups, Trucks, Industrial Vehicles, Golf Carts, ATV's, UTV's and other Powered Vehicles:

1. Pedestrians have the right-of-way at all times on the project. Drivers must yield to pedestrian traffic at all times.
2. Driver and passengers must wear safety/seat belts.
3. Obey the speed limit and other regulatory signs.
4. Look to the rear and sound your horn before backing.
5. Shut off the engine to fuel--use secondary containment pan while filling to prevent fuel spills to environment.
6. Mount or dismount only when vehicle is stopped.
7. Keep arms, feet and bodies inside vehicles at all times. Employee-owners must be seated, with seat belt fastened.
8. Employee-owners may not ride in the bed of a vehicle unless they are seated on the floor. No riding on toolboxes, fenders, tailgates or material being transported in the bed of the vehicle.
9. A flagman must be used to direct the backing of a vehicle if the driver's view is obstructed, or the area is congested.
10. No more than three people may ride in the front seat of any vehicle.
11. Engines must be shut off and parking brakes set, or equipment securely blocked when vehicles are left unattended (out of sight or > 25 feet).
12. Operator will remain within 25' of the vehicle when it is left running.



- 
- 13.** Cell phone use is prohibited while traveling or operating equipment unless required for the operation. If a phone call must be taken, the vehicle/machine must be safely parked with ground-engaging devices lowered.



---

## 29. Concrete, Forms, and Shoring

### Concrete

#### 1. Placement:

- Employee-owners involved in the direct placement of concrete (at chute, pump hose, or bucket) must be provided with personal protective equipment. Contact your safety representative to assist with a proper PPE assessment that will determine the needed equipment. This may include the following: head protection (hardhat), eye protection (ANSI approved glasses and/or face shield), hand protection (rubber gloves), foot protection (rubber boots, toe protectors), skin protection (long-sleeved shirts, barrier cream, and vinegar to neutralize the alkaline content of the concrete).
- Special attention must be given to the setup of placing equipment to ensure that power lines will not interfere with equipment or tools being used. Place Overhead Power Line signs as required to warn employee-owners of any electrical hazards in the area.
- Handles on bull floats must be constructed of non-conductive material or verify that no overhead electrical power lines are within 15-ft. reach of the end of the handle.
- Powered and rotating-type concrete trawling machines that are manually guided must be equipped with a control switch that will automatically shut off the power when controls are released.
- Handles of buggies must not extend beyond the wheels on either side of the buggy to prevent hand injuries to the operator.
- Concrete pumping systems using discharge pipes must be provided with pipe supports designed for 100% overload.
- Employee-owners are prohibited from releasing concrete into the truck chute while the mixer is rotating. This is the responsibility of the mixer truck operator.



---

## 2. Concrete Buckets

- Concrete buckets must be inspected for proper operation and lifting before use.
- Riding concrete buckets for any purpose is prohibited.
- Placement and vibrator crews may not work directly under concrete buckets suspended from cranes.
- Care must be taken when hoisting or swinging concrete buckets to avoid swinging over other personnel working in the area. Where it is impossible to avoid, the operator must sound a horn to warn employee-owner(s) of the suspended load.

## 3. Reinforcing Steel

- Employee-owners involved in handling, placing, and tying of reinforcing steel must wear gloves.
- Employee-owners placing and tying reinforcing steel and subject to a fall of six feet or more must be provided with and directed to wear safety harnesses with proper fall arrest devices.
- Employee-owners may not be permitted to work above vertically protruding reinforcing steel unless it has been protected to eliminate the hazard of implementation.
- Reinforcing steel for walls, piers, columns, and similar vertical structures must be properly guyed and supported to prevent overturn or collapse.
- Wire mesh rolls must be secured at each end to prevent dangerous recoiling action.

## 4. Personal Protective Equipment:

- Hard hats meeting the requirements of the Personal Protective Equipment Section of this manual and ANSI standards must be worn.
- ANSI-approved safety glasses with side shields or goggles must be worn.



- 
- Rubber gloves and boots must be worn by employee-owners subject to contact with wet concrete.
  - Leather or other cut-resistant gloves must be worn by employee-owners involved in formwork and reinforcing steel placement.
  - Washing facilities must be available to remove wet concrete from the skin to prevent burning.

## Forms & Shoring

### 1. General Provisions

- Formwork and shoring must be designed, erected, supported, braced, and maintained so that it will safely support vertical and lateral loads that may be imposed upon it during placement of concrete.
- Drawings or plans showing the jack layout, formwork, shoring, working decks, and scaffolding must be available at the job site.
- Stripped forms and shoring must be removed and stockpiled promptly after stripping in areas in which persons are required to work or pass. Protruding nails, wire ties, and other form accessories not necessary to subsequent work must be pulled, cut or other means taken to eliminate the puncture hazard.
- Metal form material will be properly stored at the perimeter of the work area or project until transported off-site.

### 2. Fall Protection:

- Fall protection must be planned out before any formwork is started. If employee-owners are to work at elevations, that will subject them to fall six feet or greater, fall protection must be provided.
- Where possible, handrails and guardrails must be erected as the recommended means of fall protection.
- Holes in formwork and other walking/working surfaces two inches or greater in their least dimension must be covered. Hole covers must be

---

capable of carrying twice the anticipated load. Hole covers must be labeled as such. Training must be conducted to instruct employee-owners never to remove hole covers unless directed to do so by a supervisor.

- Where it is necessary to use personal fall arrest systems, they must include the following:
  - i) Full body harnesses.
  - ii) Horizontal lifelines must be of an appropriate diameter cable carrying the number of people expected to be tied off at any one time. Allow 5,000 lbs. per person or have a system designed by a qualified person.
  - iii) Fall protection equipment must be inspected prior to each use.
- A competent person must train employee-owners in the proper use of fall protection equipment.

## **Concrete Bridge Construction**

### **1. Columns and Caps:**

- Column Forms (cans) shall be secured from movement, bolted to the foundation, guy wired and/or use of similar methods.
- Entry into column forms requires the use of safety harnesses and retrieval systems. A company safety representative should be consulted regarding the applicability of the Confined Space Entry procedure outlined in this manual before requiring employee-owners to enter column forms.
- Once the column forms are removed, they shall be placed on their sides horizontally for cleaning and shipping.
- Friction collars used to support the cap formwork will be constructed/erected according to the design provided by the qualified person. A competent person before application to ensure that it is the proper size and design specified by the qualified person will inspect friction collars. No defective friction collars will be utilized.





- 
- Work platforms placed around the cap formwork will have standard guardrails provided to prevent falls. The platform and guardrails shall be designed by a qualified person and shall be erected according to the approved plans.
  - Employee-owners required to remove formwork from a completed cap will utilize safety harnesses and lanyards as required in the Fall Protection section of this manual.

**2. Beam Placement:**

- Properly secured ladders and/or other approved means will be utilized to safely access the column cap.
- Employee-owners will be provided with required fall protection and attachment points for bridge beam placement.
- Prior to setting pre-stressed concrete bridge beams, the beams shall be inspected on the truck and during the lift by a competent person in an attempt to identify any significantly overstressed beam (subject to implosion) prior to setting on bridge cap.
- Before lifting beams into place on the caps, cable attachments, and anchors will be installed on the beam(s) so that once the beam is in place on the cap, the cap crew will have the necessary harness (lanyard) attachment for fall protection while setting beam braces and pans.
- The crane(s) utilized to place the beams will operate on stable level ground. (Site preparation may be necessary to meet this requirement).
- A written lift plan must be prepared and followed whenever a two-crane lift or lifts over 75% of the crane's capacity are performed.

**3. Deck Pans:**

- No pans or pre-formed metal decking (PMD) will be distributed without being secured as it is placed.



- 
- Fall protection will be utilized by employee-owners as pans are being placed and bolted down.

**4. Bridge Deck:**

- Concrete buckets will not swing over employees when buckets are filled with concrete. The crane operator will sound the crane horn to get employee-owners attention before bringing in a load of concrete for placement.
- Employee-owners assigned to erect perimeter bridge deck overhang braces will utilize personal fall arrest systems and approved access such as man lifts. Braces will be installed as designed by a qualified person.
- Perimeter guardrails/cables will be erected and maintained according to the Fall Protection section of this manual.
- Proper access and egress will be maintained at the bridge deck under construction (may require the use of scaffolding stair towers or other approved methods).
- Personnel required to work in positions where the guardrails do not provide fall prevention are required to utilize a personal fall arrest system.
- See the Scaffolding section of this manual for requirements pertaining to overhang bridge scaffolding.
- Materials will be stored at least 6 ft. from the edge of the bridge deck and scrap materials will be picked up as often as necessary to keep the work area uncluttered.
- Form materials will be picked up when removed and disposed of or stored for future use. Nails will be removed prior to scrapping and/or storing used form material.
- Materials subject to being blown over the side of the bridge deck will be tied down.



---

## Cofferdams

1. If overlapping of the cofferdam by high water is possible, means shall be provided for controlling flooding inside the work area. Supervision will ensure safe access and egress is maintained at all times.
2. Warning signals for evacuation of employee-owners in case of emergency shall be developed and posted.
3. Cofferdam walkways, bridges or ramps with at least two means of rapid exit shall be provided and equipped with guardrails.
4. Cofferdams, located close to navigable shipping channels shall be protected from vessels in transit.
5. When equipment is to be run inside a cofferdam, provisions must be made to exhaust the equipment to the outside. If the cofferdam is deeper than 4 ft. and is subject to the accumulation of toxic vapors/gases (such as equipment exhaust containing carbon monoxide) and/or oxygen deficiency (such as a cutting rig with leaking bottle of acetylene which displaces oxygen), the requirements outlined in the Confined Space section (# 24) of this manual must be followed. This will include atmospheric testing with properly calibrated monitors. Also, refer to Section 16 – Marine Operations for additional information.
6. Life preservers, ring buoys, and motorized boats must be provided, see the Marine Operations section of this manual and/or the OSHA standards.
7. When workers are in the cofferdam, continual visual contact between personnel in the excavation and workers outside the structure should be maintained. (This will enable prompt recognition and response to any problems encountered within the structure e.g.: illness, injury, water leakage, etc.)

## Lift Slab Construction

This construction method will require the approval of the Company President in consultation with the engineering and safety departments before engaging in the work.



---

Note: Requirements for steel beam bridge erection will comply with the applicable requirements contained in this section (such as column and cap construction) and applicable requirements contained in the Steel Erection section of this manual.

---

## 30. Steel Erection

### General Requirements

#### *Pre-Construction Steel Erection Plan*

Supervision will conduct a pre-construction conference(s) and site inspection(s) involving the necessary representatives of the following: erectors, structural engineer of record, fabricator, project management, and others to develop a specific site erection plan containing at least the following components:

1. The sequence of erection activity, developed in coordination with the construction manager/general contractor and steel erectors.
2. Material deliveries, staging, and storage in coordination with other contractors or subcontractors.
3. Description of the crane/derrick selection and placement procedures including site preparation, the path of overhead loads, and critical lifts to include rigging supplies and equipment.
4. A description of steel erection activities and procedures including stability considerations requiring temporary bracing and guying, erection bridging/diaphragms, terminus point, anchor bolt (rod) notifications regarding repair, replacement and modifications, columns and beams including joists and purlins, connections, decking, and ornamental and miscellaneous iron.
5. A description of any special procedures required for hazardous non-routine tasks.
6. A description of the procedures that will be used for rescue or emergency response.

Note: The Pre-construction Steel Erection plan must include identification of the site and project and be signed and dated by the qualified person(s) responsible for its preparation and modification.



---

## 31. Sling Safety

### General Requirements

Sling function, use, and service are determined by the following:

- The qualified rigger must make the selection and connection of the slings.
- Slings must be selected in accordance with their intended use, based on the size and type of load and the environmental conditions of the workplace.
- Slings must be visually inspected before each use to ensure there is no damage to the sling.

### Sling Types

Slings are generally one of four types:

- chain
- wire rope
- synthetic fiber rope
- synthetic web

The qualified rigging must consider/determine the following prior to selecting the correct rigging configuration:

- Size of the material to be moved.
- Weight of the material to be moved.
- Shape of the material to be moved.
- Temperature of material and work area.
- Sensitivity of the material to be moved.
- The environmental conditions under which the sling must be used.
- The path of the material being moved

Storage:

- Slings must be stored in a dry, ventilated environment.

- 
- Do not store them on the ground or allow them to be continuously exposed to the elements.

## **Chains**

- Use of chains for lifting/hoisting is prohibited unless, approved by the project superintendent and safety director, or designee.
- Chains must be alloy steel and specifically made for hoisting
- Must have load rating tag attached by the manufacturer

## **Wire Rope**

### ***Wire Rope Sling Selection Criteria***

When selecting a wire rope sling to give the best service, there are four characteristics to consider: strength, ability to bend without distortion, ability to withstand abrasive wear, and ability to withstand abuse.

- Strength
  - Wire rope slings have a design factor of 5. However, as a sling suffers from the rigors of continued service, both the design factor and the sling's ultimate strength are proportionately reduced. For this reason, older slings must be more rigorously inspected to ensure that rope conditions adversely affecting the strength of the sling are considered in determining whether or not a wire rope sling should be allowed to continue in service.
- Fatigue - (Bending Without Failure)
  - A wire rope must have the ability to withstand repeated bending without the failure of the wires from fatigue. Fatigue failure of the wires in a wire rope results from repeated applications of bending loads. It occurs when ropes make small radius bends. The best means of preventing fatigue failure of wire rope slings is to use blocking or padding to increase the radius of bend.



- 
- Abrasive Wear
    - The ability of a wire rope to withstand abrasion is determined by the size, number of wires, and construction of the rope. Smaller wires bend more readily and therefore offer greater flexibility but are less able to withstand abrasive wear. The larger wires of less flexible ropes are better able to withstand abrasion than the smaller wires of the more flexible ropes.
  
  - Abuse
    - Other factors being equal, misuse or abuse of wire rope may cause a wire rope sling to become unsafe long before any other factor. Abusing a wire rope sling may cause serious structural damage to the wire rope, such as kinking or bird caging. (In bird caging, the wire rope strands are forcibly untwisted and become spread outward.) Therefore, in order to prolong the life of the sling and protect the lives of employee-owners, the manufacturer's suggestions for safe and proper use of wire rope slings must be strictly adhered to.

### ***Wire Rope Life***

Many operating conditions affect wire rope life. They are:

- Bending, stresses
- Loading conditions
- Speed of load application (jerking)
- Abrasion and corrosion
- Sling design
- Materials handled
- Environmental conditions
- History of previous usage





---

### ***Wire Rope Sling Inspection***

Wire rope slings must be visually inspected before each use by the operator or rigger.

- Check the twists or lay of the sling.
- Broken wires
- End fittings and other components must also be inspected for any damage, which could make the sling unsafe.
- Report any defects or sling incidents to a supervisor.

### ***Discarding Slings***

Wire rope slings can show early signs of failure; however, this requires frequent inspection to recognize. Factors that require that a wire sling be discarded include:

- Excessive broken wires for strand-laid and single-part slings, 10 randomly distributed broken wires in one rope lay, or 5 broken wires in one strand in one rope lay
- Must have a legible identifier
- Severe corrosion
- Localized wear (shiny worn spots), the reduction from nominal diameter of more than 5%
- Damage or displacement of end fittings, hooks, rings, links, or collars
- Distortion, kinking, crushing, bird caging, or other evidence of damage to the wire rope structure

### **Fiber Rope and Synthetic Web**

#### ***Fiber Rope***

- When inspecting a fiber rope sling before use, look first at its surface. Look for dry, brittle, scorched, or discolored fibers. These conditions indicate the supervisor must be notified and a determination made regarding the safety of the sling. If the sling is found to be unsafe, it must be discarded.



- 
- Fiber rope deteriorates on contact with acids and caustics. Therefore, fiber ropes must not be used around these substances unless recommended for that use by the manufacturer.
  - Next, check the interior of the sling. It should be as clean as when the rope was new. A build-up of powder-like sawdust on the inside of the fiber rope indicates excessive internal wear and is an indication that the sling is unsafe.
  - Finally, scratch the fibers with a fingernail. If the fibers come apart easily, the fiber sling has suffered chemical damage and must be discarded.

### ***Synthetic Slings***

Each synthetic material has its own unique properties.

- Nylon
  - must be used wherever alkaline or greasy conditions exist. It is also preferable when neutral conditions prevail and when resistance to chemicals and solvents is important.
- Dacron
  - must be used where high concentrations of acid solutions--such as sulfuric, hydrochloric, nitric, and formic acids--and where high-temperature bleach solutions are prevalent. (Nylon will deteriorate under these conditions.) However, do not use Dacron in alkaline conditions because it will deteriorate. Use nylon or polypropylene instead.
- Polyester
  - must be used where acids or bleaching agents are present. It is also ideal for applications where a minimum of stretching is important

### ***Common properties***

- Strength
- Convenience
- Safety



- 
- Load protection
  - Long life
  - Shock absorbency
  - Temperature resistance up to 180°F

### ***Possible Defects***

Possible reasons for removing slings from service include the following:

- Acid or caustic burns
- Melting or charring of any part of the surface
- Snags, punctures, tears, or cuts
- Broken or worn stitches
- Red or colored thread showing
- Wear or elongation exceeding the amount recommended by the manufacturer,
- Distortion of fitting
- Manufacturer's label missing

### **Shackles**

#### ***General Requirements:***

- Domestic-made shackles
- Legible rating and weight
- Positive connection
- Next size larger than the strap
- Only rated shackle pins from the manufacturer, no mix/match

#### ***Inspection***

Wear requirements:

- Missing or illegible manufacturer's name or trademark and/or rated load identification



- 
- Indications of heat damage, including weld splatter or arc strikes
  - Excessive pitting or corrosion
  - Bent, twisted, distorted, stretched, elongated, cracked, or broken load-bearing components
  - Excessive nicks or gouges
  - 10% reduction of the original or catalog dimension at any point around the body or pin
  - Incomplete pin engagement
  - Excessive thread damage
  - Evidence of unauthorized welding

### **Safe Lifting Practices**

Now that the sling has been selected (based on the characteristics of the load and the environmental conditions surrounding the lift) and inspected before use, the next step is learning how to use it safely. There are four primary factors to take into consideration when safely lifting a load.

#### ***Size, Weight, And Center of Gravity of The Load***

- The center of gravity of an object is that point at which the entire weight may be considered as concentrated. To make a level lift; the hoisting hook must be directly above this point. If the hoisting hook is too far to one side of the center of gravity dangerous tilting may result, causing unequal stresses in the different sling legs. This imbalance must be adjusted before making the lift.

#### ***Rated Capacity of The Sling***

- The rated capacity of a sling varies depending upon the type of sling, the size of the sling, and the type of hitch. Operators must know the capacity of the sling. Charts or tables that contain this information generally are available from sling manufacturers or other approved sources. The values given are for new slings. Older slings must be used with additional caution. Under no circumstances shall a sling's rated capacity be exceeded.



---

### ***History of Care and Usage***

- Mishandling and misuse of slings are the leading cause of accidents involving their use. However, injuries and accidents may be avoided by becoming familiar with the essentials of proper sling care and usage.
- Proper care and usage are essential for maximum service and safety. Slings must be protected from sharp bends and cutting edges by means of cover saddles, burlap padding, or wood blocking, these materials are commonly referred to as “softeners”. They must also be protected from such unsafe lifting procedures as overloading and sudden jerks, which can build up a momentary overload.
- Before making a lift, check to be certain that the sling is properly secured around the load and that the weight and balance of the load have been accurately determined. If the load is on the ground, do not allow the load to drag along the ground. This may damage the sling. If the load is already resting on the sling, ensure that there is no sling damage prior to making the lift.
- Next, position the hook directly over the load and seat the sling squarely within the hook bowl. This gives the operator maximum lifting efficiency without bending the hook or overstressing the sling. Wire rope slings are also subject to damage resulting from contact with sharp edges of the loads being lifted. These edges may be blocked or padded to minimize the damage to the sling. This is especially important when using synthetic slings. Heat build-up along the un-softened edge of the load can cause the sling to fail.
- After the sling is properly attached to the load, there are a number of good lifting techniques, which are common to all slings.
  - i) Ensure that the load is not lagged, clamped, or bolted to the floor.
  - ii) Guard against shock loading by taking up the slack in the sling slowly.
  - iii) Apply power cautiously to prevent jerking at the beginning of the lift and accelerate or decelerate slowly.



- 
- iv) Check the tension on the sling. Raise the load a few inches, stop, and check for proper balance and that items are clear of the travel path.
  - v) Never allow anyone to ride on the hook or load.
  - vi) Keep personnel clear while the load is being raised, moved, or lowered.
  - vii) Crane or hoist operators should watch the load when it is in motion.
  - viii) One person should control a lift or give signals to a crane or hoist operator, except to warn of a hazardous situation.
  - ix) The load should not be raised more than necessary.
  - x) Personnel are prohibited from working under a suspended load.
  - xi) Once the lift has been completed, clean the sling, inspect it for damage, and store it properly.



---

## 32. Fall Protection Safe Practice

### Policy

Contractors and subcontractors developing site-specific fall prevention plans may need to refer to other sections of this manual, as the scope of work may require. Some other sections of this manual, which may be consulted include scaffolding, stairways & ladders, concrete construction and forms, and aerial work platforms.

Supervisors will ensure that each employee-owner has received the proper training prior to making work assignments and will also ensure that a “competent person” is assigned and properly performing the duties of the position. Employee-owners are required to comply with the practices outlined within this and other sections of the Manual.

### General Practices

1. Elevated walking/working surfaces must be evaluated to ensure strength and structural integrity to safely support employee-owners, materials, and tools.
2. Unprotected sides or edges, which are six feet or more above the lower level must be protected by fall prevention methods such as guardrails and floor hole covers, or employee-owners protected by a fall arrest system or personal fall arrest systems. Personal fall arrest systems must incorporate the use of a full-body harness.
3. An employee-owner who is constructing a leading edge six feet or more above a lower level must be protected by the use of guardrails and/or personal fall arrest system.
4. An employee-owner in a hoist area must be protected from falling six feet or more by a guardrail or personal fall arrest system.
5. If during the course of work, a guardrail system (or portion thereof) has to be removed to facilitate hoisting, landing material, etc., and an employee-owner is subject to falling six or more feet, those employee-owners must be protected by a personal fall arrest system.



---

## Specific Hazard Types

1. Holes (gaps measuring 2 inches or more in its least dimension in a walking/working surface):

- Employee-owners must be protected from falling through holes in walking/working surfaces (including skylights) by covers (labeled Hole Cover or color-coded), personal fall arrest system or guardrails erected around the entire hole.
- Employee-owners must be protected from objects falling through holes by covers, toe boards, mesh, barricades erected under the opening preventing entry or similar protective measures.
- Barricade tape may only be considered a warning and used only when there is enough room to allow for safe use as a warning (at least six feet back from the opening or edge).

2. Formwork and reinforcing steel:

Employee-owners on the edge of formwork or reinforcing steel must be protected from falls 6 feet or more to the lower level by:

- Personal fall arrest system, or guardrails.
- Positioning devices may be used while the employee-owner is in a work position and not moving. However, once the worker starts to move, a lanyard attached to a body harness must be used to provide fall protection while in motion.

3. Ramps and Runways:

When the potential exists for falls more than six feet, guardrails must be used on open sides.

4. Excavations:

- When an excavation depth is six feet or more, and employee-owners are exposed to a fall hazard, such as working near the edge of the excavation,





---

fall prevention must be provided by the use of guardrails, fences or barricades.

- Barricade tape and other warning devices, if used, must be placed back from the excavation edge at least six feet and entry restricted. If the six-foot distance cannot be maintained, a guardrail, fence or barricade must be used to provide protection.
- Employee-owners at the edge of pier holes, wells, pits, shafts, and similar openings that are six feet or more in depth must be protected by guardrails, fences, covers, barricades or personal fall arrest systems attached to an anchor point capable of sustaining 5,000 lbs. loading per person attached.

**5. Dangerous Equipment:**

Guardrails must protect employee-owners exposed to falling into dangerous equipment such as gears, pulleys, conveyors, sprockets, electrical equipment, and chemical vats, or similar exposures.

**6. Precast Concrete Erection:**

- Includes but is not limited to the erection of columns, beams, operations such as grouting, setting concrete bridge beams, etc.
- Employee-owners engaged in such activities six feet or more above lower levels, must be protected by guardrails, safety nets, or personal fall arrest systems.

**General Fall Protection**

**1. Wall openings (including chute openings):**

- a. Where the outside bottom edge of the wall opening is six feet or more above the lower level and the bottom of the wall opening is less than 39 inches above the walking/working surface, protection must be provided by guardrails, safety nets, or personal fall arrest systems.

**2. Walking/Working Surfaces Not Otherwise Addressed:**



---

Personnel walking/working on surfaces six feet or more above lower levels must be protected by guardrails or personal fall arrest systems.

Refer to other sections of this manual for fall protection requirements related to specific work activities such as steel erection, working off scaffolding, etc.

However, it is company policy that employee-owners exposed to falls six or more feet are protected regardless of the work assignment or activity.

### 3. Protection From Falling Objects:

In addition to utilizing hard hats on the site according to company policy, the following will apply:

- a. Erect toe boards, screens and/or guardrails to prevent objects from falling from higher levels.
- b. Barricade the area into which objects could fall and prohibit entry.

## **Fall Protection Systems**

### ***General Requirements for Guardrails***

- Top rail height 42 inches (+/- 3 inches) above the walking/working level.
- Midrails, screens, mesh, intermediate vertical members or equivalent must be installed between the top rail and the walking/working surface when there is no wall parapet at least 21 inches high.
- Midrails must be installed midway between the top rail and the walking/working surface (approximately 21 inches).
- Screens and mesh, when used, must extend from the top rail to the walking/working surface and along the entire opening between the top rail supports.
- Intermediate members (such as balusters), when used between the support posts, must be spaced not more than 19 inches apart.
- When working on structures or equipment that render the guardrail height ineffective in preventing falls, the height of the guardrail must be extended to



---

provide the necessary protection and/or a personal fall arrest system or safety nets utilized.

- Top rail systems must be constructed to be able to withstand a force of 200 lbs. applied within two inches of the top edge applied in any outward or downward direction at any point along the top edge. The 200 lbs. of pressure must not deflect the top edge of the guardrail to a height less than 39 inches above the walking/working surface.
- Midrails, screens, mesh, vertical members, etc., must be capable of withstanding a force of 150 lbs. applied in any outward or downward direction.
- Toe boards must be capable of withstanding 50 lbs and be at least 3 ½” high.
- Guardrail surfaces must not present puncture or laceration hazards.
- Overhang on terminal posts must not constitute a projection hazard.
- Guardrails must surround floor holes unless floor hole covers are used. When necessary, two sides of the floor hole guardrail system can be removable to allow for the movement of material but must be replaced or a hole cover used to provide the required.
- **AUSTIN BRIDGE & ROAD PROHIBITS THE USE OF WIRE CABLE IN A GUARDRAIL SYSTEM.**
- Protection when material handling operations have been completed. However, personnel exposed to falls during the time frame that the guardrails are removed must be protected by a personal fall arrest system.
- Ladder openings protected by guardrails must utilize a gate or offset to prevent accidental entry.
- Guardrails used on ramps and runways must be erected on unprotected sides.
- Access openings in handrails will be protected by a moveable gate. Gate must be closed when not in use for access.

1. Personal Fall Arrest Systems:



- 
- Safety harnesses, lanyards, positioning devices, and retractable lifelines must be purchased from a commercial supplier who will ensure compliance with the specific material construction requirements for such fall protection equipment.
  - Horizontal lifelines must have a safety factor of at least two times the intended load.
  - Lifelines must be protected from damage.
  - Self-retracting lifelines must allow for a fall no greater than two feet.
  - Anchorage for fall arrest systems must be independent of suspended work platforms and capable of supporting at least 5,000 lbs. or designed by a qualified person with safety factor of at least two.
  - Fall arrest systems must be installed and maintained under the guidance of a qualified fall protection competent person.
  - Lanyard attachment points must be in the center of the user's back, at shoulder height, for full body harnesses.
  - Fall protection equipment must only be used to provide such protection and not used for any other purpose.
  - Prompt means of rescue must be provided at the job site. It is not advisable that sites depend upon 911 service for rescue. If high angle rescue is the only rescue option, emergency services must be contacted and simulated rescue operation must be performed prior to commencement of the work.
  - Employee-owners required to utilize fall arrest systems must receive specific training on how to properly inspect such equipment and training records shall be maintained for inspection.
  - Personal fall arrest systems must not be attached to guardrail systems nor hoisting equipment.



- 
- Only cable of appropriate size for the intended load (including safety factor) must be utilized for horizontal lifelines.

2. Inspection:

- Personal fall arrest system components must be inspected by the employee-owner before use for evidence of excessive wear, damage, or other defects or deterioration.
- Damaged equipment must be removed from service and not used again until inspected and authorized by the manufacturer.
- Fall arrest equipment subjected to shock loading must be removed from service and not used again until inspected and approved for use by the manufacturer.

3. Positioning Devices:

- Such devices cannot allow for a fall greater than two feet
- Can only be attached to anchorages that can withstand an impact load of 3,000 lbs. or two times the expected shock loading (whichever is greater)
- Positioning device systems must be inspected before use
- Positioning device systems must only be used for worker safeguarding and not for any other purpose

***Warning Line Systems***

1. Must be erected on all sides of the work area.
2. When mechanical equipment is not being used, the warning line system must be erected at least six feet from the roof edge.
3. When mechanical equipment is running, the warning line system must not be erected less than six feet from the parallel edge nor less than ten feet from the edge which is perpendicular to the direction of the mechanical equipment's operation.
4. The warning system must be erected as follows:



- 
- The rope, chain, or wire must be flagged at no more than six-foot intervals with highly visible materials and have a tensile strength of at least 500 lbs.
  - The rope, chain, or wire must not sag to less than 34 inches from the walking/working surface nor erected to a height greater than 39 inches.
  - Support stanchions must be capable of supporting at least 16 lbs. of force applied horizontally 30 inches above the walking/working surface perpendicular to the warning line. The line must be attached to the stanchions in such a way that slack will not be taken up in adjacent sections before the stanchion tips over.
5. Employee-owners not performing work must not be allowed between the warning line and the surface edge.

### ***Controlled Access Zones***

1. When used to control access to leading-edge work, the area must be defined by a control line or other means which restricts access to the area.
2. Training must be conducted and exposed employee-owners must sign an attendance sheet before being allowed to work in a controlled access zone.
3. Control lines must be erected no closer than 6 feet to the leading edge nor further than 25 feet from the unprotected or leading edge.
4. The control line must be parallel and extend along the entire length of the unprotected side or leading edge. The control line shall be connected on each side to a guardrail system or wall.
5. Control lines will be erected as follows:
  - Ropes, chains, wires, or equivalent material must have a minimum breaking strength of 200 lbs. and will be flagged every six feet with high-visibility material
  - Each line will be erected so that the line is not higher than 45 inches from the working surface or less than 39 inches (including sag)



- 
- On surfaces where guardrail systems are not in place, prior to beginning work, controlled access zones must be enlarged as necessary to enclose points of access, material handling areas, and storage areas

### ***Hole Covers***

1. Covers used on roadways for vehicular traffic must be capable of supporting at least twice the expected load of the largest vehicle (axle load) anticipated crossing over the cover.
2. Other covers must be capable of supporting at least twice the weight of employee/owners, equipment and materials that may be imposed on the cover at any one time.
3. Covers must be secured to prevent accidental displacement.
4. Covers must be color-coded or labeled “Hole” or “Cover” to provide warning of the hazard.
5. These requirements do not apply to cast iron manhole covers or steel grates used on streets or roadways.

### ***Protection From Falling Objects***

1. Toeboards must be capable of withstanding a force of at least 50 pounds applied in any downward or outward direction at any point along the toeboard.
2. Toeboards must be a minimum of 3 ½ inches in vertical height and there shall be no more than a ¼ inch gap between the toeboard and the walking/working surface.
3. Where materials or tools are piled higher than the toeboard, screening or paneling must be installed between the working surface and the top rail to prevent such materials, tools, or equipment from being accidentally displaced.

### ***Training:***

1. Fall protection training must be conducted for affected employee-owners and will cover at least the following topics:
  - Nature of fall hazards



- 
- The use, operation, inspection, and maintenance of fall prevention and fall arrest systems
  - The role of each employee-owner in the safety monitoring system when this system is used
  - The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection
  - Reporting procedures for fall hazards
- 2.** Retraining must be conducted as necessary or when one of the following circumstances occur:
- Employee-owners do not demonstrate an understanding or required skill to comply with this policy
  - Changes in site conditions and/or equipment that render previous training obsolete
- 3.** Competency:
- Employee-owners completing the fall protection training will be required to demonstrate their understanding of the material presented through testing, skill demonstration, supervisory observation





---

### 33. Drug and Alcohol Testing Policy

#### I. Statement of Purpose

1. Austin Bridge & Road, Inc. (ABR) has a vital interest in ensuring a safe, healthy, and efficient working environment and in preventing accidents and injuries resulting from the misuse of alcohol or drugs. The unlawful or improper presence or use of drugs or alcohol in the workplace presents a danger to everyone. For these reasons, ABR has established the following drug and/or alcohol testing policy, which is an integral part of ensuring safe work operations. Compliance with the policy is required as a condition of employment with ABR and the continued privilege of subcontractors and their employees to work for ABR.
  - a. This policy applies to all (collectively referred to as “Covered Individual(s)”):
    - a. current ABR employee-owners, which includes ABR salaried and hourly employee-owners and employee-owners in managerial or supervisory positions
    - b. ABR Partner employees, including but not limited to Joint Venture partner employees (if ABR is the lead partner), working at any ABR Project location
    - c. Applicants for all positions, including any applicant who was formerly employed by ABR
  - b. Employee-owners employed in driver positions are also subject to the drug and alcohol testing requirements of the U.S. DOT, Federal Motor Carrier Safety Administration, and must comply with those regulations as well as this policy.
  - c. Employee-owners employed on federal railroad projects are subject to FRA drug and alcohol testing requirements and must comply with those regulations as well as this policy.
2. Questions regarding the meaning or application of this policy should be directed to ABR’s Human Resources Departments.



- 
3. This policy is not a contract of employment. All ABR employee-owners are “employees at-will”. This means that employment can be terminated at any time either by the employee-owner or ABR with or without cause and with or without notice. Rather, this policy sets out expectations for employee-owners conduct that, if not followed will subject that employee-owner to discipline, up to and including termination. Applicants in violation of this policy will not be hired.

## II. **Prohibited Conduct Concerning Alcohol and Drugs**

1. The following conduct by Covered Individuals is prohibited:
  - a. Reporting for work, remaining on duty, or driving ABR vehicles or personal vehicles on ABR business with any amount of alcohol in the Covered Individual’s system.
  - b. Consuming alcohol at any time during a Covered Individual’s workday. This includes, but is not limited to, while a Covered Individual is on or off the premises of ABR, as well as during meal and other break periods. This is a zero tolerance policy. Individuals who test positive for alcohol at 0.02 or more will be subject to disciplinary action, up to and including termination. Exception: This prohibition does not include the authorized and Reasonable Consumption of alcohol by Covered Individuals of legal drinking age at functions or activities sponsored by ABR or a client during the workday when alcohol is provided at these functions, provided they act responsibly and refrain from becoming intoxicated or impaired. Solely for this purpose, “Reasonable Consumption” shall mean a breath or blood alcohol result of less than 0.04. A breath or blood alcohol result of 0.04 or greater is a violation of this policy.
  - c. Consuming alcohol within the eight-hour period immediately following a work-related accident or until the Covered Individual has submitted to a post-accident alcohol test or has been informed that no test is required, whichever comes first.
  - d. Engaging in any illegal possession, sale, transfer, solicitation, or use of drugs at any time while on or off duty. This includes, but is not limited to,



---

while a Covered Individual is on or off the premises of ABR, as well as during meal and other break periods.

- i) This prohibition does not apply to prescription or over-the-counter medications taken by Covered Individuals which:
- ii) Have been lawfully prescribed to, or obtained by, the Covered Individual;
- iii) Are being used by the Covered Individual in accordance with the prescription's guidelines (if applicable); and
- iv) Before reporting to work under the influence of such medication, the Covered Individual has inquired whether the drug manufacturer or the Covered Individual's physician warns against driving, operating machinery or performing other work-related tasks. If such warnings exist, the Covered Individual taking the medication must inform his or her supervisor of such restrictions before reporting to work under the influence of such substances. When informing his or her supervisor(s) or the Human Resources Department of such restrictions, **the Covered Individual should not identify the medication(s) being used or the reason for its use.** ABR will evaluate and respond to this information on a case-by-case basis. Responses may include, among other things, temporary job reassignment or modifications, a request by HR for additional medical documentation and consultation, and/or an instruction that the Covered Individual does not work until the restriction is removed. Any Covered Individual reporting to work without first observing these safety precautions will be subject to disciplinary action up to and including termination. A Covered Individual's lack of knowledge concerning such warnings will not excuse a violation of this rule where the Covered Individual has failed to make the inquiries required by this policy.



- 
- e. Failing to stay in contact with ABR or its medical review officer (MRO) while awaiting the results of a drug and/or alcohol test.
  - f. Engaging in the unlawful or unauthorized manufacture, distribution, dispensation, solicitation, sale, purchase, transfer, or possession of drugs or alcohol while on ABR paid time, on ABR premises, in ABR vehicles, or while otherwise engaged in activities for or on behalf of ABR. This prohibition does not include the authorized distribution, dispensation, solicitation, sale, purchase, transfer, or possession of alcohol at ABR sponsored functions as long as those participating do so in accordance with this Policy.
  - g. Testing positive on any drug and/or alcohol test required under this policy.
2. Refusal to Submit to a Test: A Covered Individual who engages in any of the following conduct will be considered to have refused to submit to a test:
- a. Refusing or failing to appear for any drug and/or alcohol test within a specified time, as determined by ABR, after being directed to do so by ABR;
  - b. Failing to sign an authorization form permitting the release of the drug and/or alcohol test results to ABR;
  - c. Failing to remain at the testing site and cooperate with the collector until the testing process is complete;
  - d. Failing to attempt to provide a specimen for testing;
  - e. Failing to provide a sufficient urine, breath, or saliva specimen for testing without a medical reason. Please advise Human Resources and/or the collector as soon as possible if you are in need of an accommodation to participate in the testing process;
  - f. Failing to submit a second specimen or take a second drug and/or alcohol test that ABR or collector has directed to be taken;
  - g. Adulterating or substituting a urine specimen, or attempting to adulterate or substitute a urine specimen;



- 
- h. In the case of a directly observed or monitored collection in a drug test, failing to permit the observation or monitoring of the provision of a specimen (unless prohibited by law);
  - i. Refusing or failing to notify ABR promptly that the Covered Individual was involved in a work-related accident, without a valid excuse; or,
  - j. Failing to cooperate with any part of the testing process, such as by delaying the collection, testing, or verification process or otherwise engaging in conduct that clearly obstructs or manipulates, or attempts to obstruct or manipulate, the testing process.

The refusal to submit to any drug and/or alcohol test required by ABR may result in discipline, up to and including termination.

### **III. Required Tests**

- 1. Covered Individuals are required to submit to testing under the circumstances described below. Except where conditions otherwise require, all tests will normally be conducted either during or immediately after the regular work period, which includes any period when a Covered Individual is working overtime.
  - a. ABR, or Subcontractors as appropriate, shall transport or make arrangements for the transport of Covered Individuals to and from the collection site for all “reasonable suspicion” and “post-accident” tests.
  - b. A Covered Individual who is required to submit to a “reasonable suspicion” or post-accident test will be suspended and not allowed back on ABR premises after the completion of the drug and/or alcohol tests, pending the test results. ABR also reserves the right to evaluate the Covered Individual’s conduct that triggered the drug and/or alcohol test, to determine if the conduct in and of itself warrants discipline, up to and including termination.



---

2. Pre-employment Drug Testing of Applicants

All applicants to whom ABR has given a conditional offer of employment are required to submit to a pre-employment drug test and must receive a negative result as a condition of employment.

3. “Reasonable Suspicion” Drug and/or Alcohol Testing

- a. A Covered Individual must submit to a drug and/or alcohol test whenever ABR has reason to suspect the Covered Individual has or may have used drugs or alcohol in violation of ABR’s policy.
- b. ABR’s “reasonable suspicion” determination will be based on specific, current observations, including but not limited to the Covered Individual’s appearance, behavior, conduct, speech, or body odors. These observations may also include observations consistent with the chronic use of, or the effects of withdrawal from, drugs or alcohol. The determination may be based on a single instance of conduct involving a serious potential risk of harm to the Covered Individual or others, or to Company property or the property of others.

4. Post-Accident Drug and/or Alcohol Testing

- a. A drug and/or alcohol test will be administered to any Covered Individual that is injured and/or involved in a work-related accident.
  - i) As used in this policy, “work-related accident” means an accident:
    - (1) which occurs while the Covered Individual is on the premises of ABR or at another work-site location, or is off-site while engaged in activities for or on behalf of ABR, or while the Covered Individual is operating a vehicle, for or on behalf of ABR, and
    - (2) the accident results in one or more of the following: (i) a fatality; (ii) bodily injury to any individual who, as a result of the accident, requires treatment at or away from the scene of



---

the accident; or (iii) property damage to ABR property, to the property of a customer or public property.

- b. Covered Individuals who are involved in a work-related accident must remain readily available for testing or will be considered to have refused to submit to a test. However, a Covered Individual who is involved in a work-related accident is not prohibited from leaving the scene of an accident for the period of time necessary to obtain assistance in responding to the accident or to obtain necessary emergency medical care for those who are injured as a result of the accident.

**5. Random Drug and/or Alcohol Testing of Covered Individuals**

- a. ABR may conduct random drug tests on Covered Individuals and random alcohol tests of Covered Individuals with safety-sensitive job duties.
- b. Covered Individuals subject to random testing will be put into one or more random selection pools and will be selected for testing by ABR using a random selection process that ensures that each Covered Individual in the selection pool has an equal chance of being selected each time a selection is conducted. Safeguards will be used to ensure that the identity of Covered Individuals who could be selected cannot be determined until after a Covered Individual is actually selected.
- c. Whenever a Covered Individual is notified of his or her selection, the Covered Individual must proceed to the test site immediately, and no Covered Individual will be excused. Notifications to report for testing will be made only during the individuals' regular work period.
- d. For this section only, Covered Individual will exclude employees of subcontractors unless random testing is required by the project owner or contract. Subcontractor employees may also be required or permitted to be enrolled in a random testing program pursuant to their own company policies as may be required by the project owner or contract.

**6. Other Drug and/or Alcohol Testing of Covered Individuals**

- a. All Covered Individuals may be subject to testing as follows:



- 
- i) When a contractual condition requires that ABR certify that Covered Individuals working at ABR work locations have passed a pre-access drug test within a prescribed period and also agree to perform the following specified tests:  
  
Covered Individuals who are assigned to those ABR work locations will be subject to drug and/or alcohol testing as specified in those contracts.
  - ii) Where required by law as a condition of performing their job duties.

#### **IV. Consequences For Policy Violations**

- 1. Covered Individuals who violate ABR's policy are subject to the following consequences:
  - a. Refusal To Submit: Although Covered Individuals have a right to refuse to submit to a test, refusal to submit to a test when requested will be ineligible for Project access and/or terminated from employment. Refer to section II. B. of this policy for a description of the conduct, which will be considered as a refusal to submit to a test.
  - b. Positive Test Results: Any Covered Individual who receives a confirmed positive drug test result or an alcohol test result of 0.02 or greater will be ineligible for Project access and/or terminated from employment.
  - c. Other Policy Violations: The Covered Individual will be immediately removed from his or her job duties and will be subject to discipline, up to and including termination. In addition to the consequences imposed under this policy, a Covered Individual who unlawfully manufactures, distributes, possesses, or uses a controlled substance may be subject to criminal fines and/or imprisonment under federal, state and/or local law.
  - d. Fitness-For-Duty Evaluation: A Covered Individual required to submit to a "reasonable suspicion" test but who receives a negative test result may also be required to submit to a medical fitness-for-duty evaluation if it appears that the behaviors or observations that led to the request for a drug test may have a medical cause. The purpose of the evaluation is to





---

determine whether the Covered Individual is able to work safely, with or without a reasonable accommodation, or poses a significant risk of substantial harm to the health and safety of the Covered Individual or others. Covered Individuals will be asked to participate in the examination and to authorize the release and review of medical records to the healthcare professional selected to conduct the examination. Failure to participate in this process could result in discipline or removal from the work place. Depending upon the results of the evaluation, ABR will endeavor to accommodate any Covered Individual who can work safely with or without a reasonable accommodation, as if applicable.

### **Test Procedures**

1. Trained collectors will work with the tested individual to obtain a specimen for testing and to package it for secure transport in tamper-evident containers following a chain-of-custody process. Individuals will be accorded reasonable individual privacy in the testing process. If an observed collection is required, the observer will be a same-gender trained collector.
2. All drug test specimens will be screened, and any test specimen that is presumptively positive will be subjected to a confirmatory test at a certified laboratory using gas chromatography/mass spectrometry (GC/MS). Only if the GC/MS test is positive will the test result be deemed positive. Alcohol tests using saliva or breath may be conducted and confirmed at the collection site but will be performed by a trained tester who is not the individual's direct manager.
3. Drug tests reported as positive will be forwarded to the company's retained Medical Review Officer (MRO). After reviewing the chain of custody and laboratory results, the MRO will contact the tested individual and offer the individual the opportunity to discuss, in confidence, any medical reason that might explain the positive result. If the MRO concludes that the test results can be explained by legitimate medical reasons (such as the individual holding a prescription for the substance detected in the test specimen), the MRO will report the test as negative.



4. Covered Individuals will be provided with a copy of their test results if they test positive, or if there are other confirmed non-negative results.
5. ABR will pay for all drug and/or alcohol tests required by ABR, which includes a confirmation drug test performed on an applicant's or an employee-owner's primary specimen when the initial test is non-negative. ABR will also pay for the cost of ABR employee-owners transportation to a collection site when the test is conducted at a place other than the employee-owner's normal work site.
6. Individuals whose tests are verified positive after MRO review may ask that their test specimen be forwarded to an independent laboratory for additional testing at their own expense.
7. All time an employee-owner spends providing a saliva, breath, or urine specimen, including travel time to and from the collection site in order to comply with a test required under this policy, shall be considered as work time.

#### **List Of Drugs to Be Tested\***

- Alcohol
- Carboxy-THC (Marijuana-MET)
- Amphetamine/Methamphetamine
- Benzoyllecgonine (Cocaine-MET)
- Opiates (Codeine/Morphine)
- Phencyclidine "PCP"
- Barbiturates
- Benzodiazepines
- Propoxyphene
- Methadone
- Methaqualone

*\* This list cannot and is not intended to be all inclusive.*



---

## **34. Working Near or Over Water**

### **Policy**

Prior to starting work near or over water, where it is likely that an employee-owner might fall into the water, the work area will be evaluated by the competent supervisor.

### **Responsibilities**

#### ***Safety Director***

The Safety Director or designee is responsible for:

- Developing, identifying, or approving training for Competent Persons and personnel who work near or over water bodies in accordance with this procedure.
- Serving as a resource to site personnel on working near or over water hazards and controls
- Auditing compliance with this procedure

#### ***Project Manager and Superintendent***

Project Managers and Superintendents are responsible for implementing the requirements of this procedure on their projects.

#### ***Foremen***

Each foreman is responsible for ensuring that their crew follows the procedure as outlined herein when working near or over water.

#### ***Employee-owners***

Employees-owners are responsible for complying with the requirements of this procedure.

#### ***Competent Person***

The Competent Person is responsible for:

- Inspecting the work area prior to personnel entering
- Advising the job foremen in safe work practices and conditions



---

## Definitions

For the purposes of this policy/procedure, working near or over water refers to any work location where the possibility exists to have an employee-owner fall from the work location and fall into a permanent body of water such as a pond, lake, or river. Bodies of water that are the result of recent rainfall are not typically included in the definition.

## General Requirements

### 1. Water Operations

- a. All employees working on barges and/or boats will be provided with a US Coast Guard-approved life jacket or buoyant work vest.
- b. Each life jacket and buoyant work vest will be inspected daily before use for defects that could alter their strength and buoyancy. Defective items will not be used and removed from service.
- c. Ring buoys with at least 90 feet of line will be readily available for emergency rescue operations. Ring buoys will be spaced at no more than 200-foot intervals.
- d. A lifesaving skiff/boat will be immediately available at locations where employees are working over or near the water.
- e. A minimum of two employee-owners will be trained to operate the skiff, and at least one will be available while work is ongoing near or over water.

### 2. Crane Barge Operations

- a. Land cranes on barges shall be positively secured with a restraint system and will be certified by a registered PE.
- b. A Critical Lift Plan shall be required whenever a lift is over 75% of the crane's marine chart capacity.
- c. All cranes must be supported by adequate crane mats placed on the barge surface to equally distribute the weight of the crane onto the interior bearing structure of the crane barge or barge system. Crane mats shall be restrained from movement along the barge surface during use.



- 
3. Floating Barge Operations
    - a. Barges will be inspected daily by a competent person.
    - b. Each barge will not exceed 5 degrees of list or trim for barges holding cranes and 2 degrees of list or trim for barges holding man lifts. At all times the entire underside of the barge will be submerged.
  4. Boom lifts operating on barges
    - a. When a boom lift will be operated while stationed on a barge, the following shall be in place to prevent the possibility of the lift being driven off the floating barge:
      - i) The lift will be secured to the barge using steel chains secured in a manner that removal will require tools or equipment not readily available to the typical craftsman (example: Welded directly to the barge). Securement of the lift will be completed under the supervision of the project superintendent. Securement chains may only be removed under the direction of the area manager for the operation.
      - ii) These requirements shall be implemented with specific training of all employee owners and supervisors involved in the operation. Subcontractor training for these procedures must be completed by the project superintendent prior to accessing an ABR barge. In no case will the lift be operated without the restraint system being in place and inspected at the start of each shift.
    - b. When working from a boom lift sitting on a barge, employees will be required to wear a life jacket or buoyant work vest in addition to conventional fall protection due to possible drowning hazards.
      - i) If working over the barge deck or land mass, conventional fall protection will be utilized.
      - ii) When working over water, where tie off creates a potential entrapment risk, a buoyant work vest or US Coast Guard Approved



---

life jacket will be utilized to prevent potential entrapment inside the basket. In this circumstance, tie off to the basket is prohibited due to infeasibility and creating a greater hazard to the worker.

**5. Fixed Structures Over Water**

- a. Where employees are working on fixed structures over water, such as column caps, bridge beams or bridge decks, conventional fall arrest systems will be used where fall arrest anchorages are available or conventional guardrails are available.
- b. Where employees are working on fixed structures over water and conventional fall arrest or prevention measures are not feasible, life jackets or buoyant work vest shall be worn.

**6. Daily Job Hazard Analysis (JHA)**

- a. Daily JHA will include working near water hazards and controls of those hazards.
- b. The water rescue/recovery plan will also be included in the JHA.
- c. In the event of a water rescue, call the appropriate emergency responders for assistance.

**Loading and Unloading Barges**

Equipment and materials that will be loaded onto barges to supplement work on or over the water will be handled in one of two ways, as described in the following:

- 1. Equipment such as cranes, drilling rigs, and loaders that need to work on the barge will be driven from the land to the barge with the following precautions.
  - a. Secure the barge to the bulkhead or other land anchor
  - b. Use mats to create the transition from land to the barge
  - c. Personnel working on the barge shall wear a life jacket or buoyant work vest
  - d. Spotter will be used to assist the operator in positioning the equipment



- 
2. Materials and equipment may be loaded onto the barge by using either a land based or barge based crane. The following safety precautions will be in place.
    - a. Barge will be secured by tying to the bulkhead or be held in place by the tug boat while materials are landed.
    - b. Personnel working on the barge shall wear life jacket or buoyant work vest.

In the event that one of these methods will not work for material loading, the competent person will develop a pre-task plan outlining the steps required to load the materials, the hazards associated and the controls to be used in that special situation.

---

## 35. Temporary Traffic Control Procedures

### Responsibilities

- The Safety Department will maintain a list of trained TTC supervisors. Lane closures will be placed under the supervision of qualified personnel.

### Worker Protection

- Personnel setting up or removing lane closures will be escorted by a “pilot” Truck Mounted Attenuator (TMA) that is in close proximity to affected workers exposed to traffic on roadways with a posted speed limit greater than 45 MPH. It is the Project Manager’s discretion whether a TMA will be used if the posted speed limit is less than 45 MPH.
- All AB&R workers and equipment are required to work within the active TTC closure area, including mobile TTC operations.

### Edge of Roadway Protection

- Edge of roadway protection will follow Texas Manual on Uniform Traffic Control Devices (TMUTCD) standards and contract traffic control plans (TCP) provided by the owner.
- Minimum 3:1 ratio slopes will be installed from the edge of the roadway each time a work site becomes inactive regardless of duration unless: 1) the roadway edge is specified by an alternative method/means in the project contract, or 2) an alternative method/means is approved in writing by the contract owner or its authorized representative.
- All alternatives to a minimum 3:1 edge of roadway slopes must be approved in writing with a specific TCP added to the contract TCP designs by the contract owner or its authorized representative.
- Tapers to asphalt placement may be used in conjunction with the active TCP to achieve an edge of roadway condition with less than a 2” vertical drop off or as required by the contract documents.





---

## **Lane Transitions**

- Transitions between roadway lanes and shoulders will be installed to ensure the maximum horizontal transition between lanes is less than 1" vertical unless alternative direction is approved in writing by contract owner.

## **Inspection of traffic/phase switches**

- PM or qualified designee will inspect and document all traffic shifts or changes prior to placing traffic on the new traffic pattern.

## **Inspection of TTC**

- PM or their qualified designee will perform TTC inspections and document this process inside HCSS inspections. TTC and working conditions should be inspected and modified as the work progresses and conditions warrant, such as wear due to road users, lighting, weather, and accidents. Inspections will consider if the TTC devices and layouts are effective, clearly visible, clean, and in compliance with the TTC. Inspections of the entire TTC plan must take place and be documented at a minimum of once per week but will take place and be documented more frequently as the project conditions require.



---

## **Appendix A: Definitions Applicable to Safety Policies, Procedures, and Practices**

**Action Level**—this is the point at which employers must initiate certain provisions: employee exposure measurements, employee training, medical surveillance, etc. The "action level" is defined as one-half of the permissible exposure. Setting the "action level" at one-half the PEL protects employees from overexposure.

**Approved**—sanctioned, endorsed, accredited, certified, or accepted as satisfactory by a duly constituted and nationally recognized authority or agency. As an example, NIOSH approves respirators. Safety glasses and hard hats are not "approved"; they meet the appropriate ANSI standards (or guidelines).

**Authorized Person**—a person approved or assigned by us to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite. An "Authorized Person" is any employee-owner designated or assigned as such by a company supervisor and/or manager.

**Barricade**—an obstruction to deter the passage of persons and/or vehicles.

**Combustible liquid**—a liquid having a flash point at or above 100 degrees F and below 200 degrees F.

**Combustion**—any chemical process that involves oxidation sufficient to produce light or heat.

**Competent Person**—one who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employee-owners and who has the authorization to take prompt corrective measures to eliminate them. The responsible Regional Operations Vice President, with the approval of the Company Safety Director, will designate "Competent Persons." A letter of appointment will be placed in the employee-owner's personnel file, and the jobsite will post a listing of all assigned competent persons and areas of expertise.

**Confined Space**—Spaces having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or oxygen-deficient atmosphere. Confined or enclosed spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults,



---

tunnels, pipelines, and open top spaces more than 4 feet in depth, such as pits, tubs, vaults, and vessels.

**Controlling Employer**—(see multi-employer worksites)

Types of Controlling Employers:

- An employer who has a specific contract duty to control worksite safety and health
- Control established by a combination of other contract duties, such as when a contract lacks a specific control clause but other contract requirements give a broad responsibility at the site which involves almost all aspects of the job
- Control exercised without specific contract authority, in actual practice, the employer exercises broad control over subcontractors at the site

**Designated Person**—an "authorized person."

**Flammable**—capable of being easily ignited, burning intensely, or having a rapid rate of flame spread.

**Flammable Liquid**—a liquid having a flash point below 100 degrees F and having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100 degrees F.

**Flash Point**—the temperature at which a liquid gives off vapor sufficient to form an ignitable mixture with the air near the surface of the liquid or within the vessel used as determined by appropriate test procedure.

**Hazardous Chemical**—any chemical that is a physical or health hazard. Example categories include corrosives, flammable/combustible liquids and gases, toxic (both acute and chronic health effects), and/or incompatible materials.

**Liquefied Petroleum Gases (LPG or LP Gas)**—includes any material that is composed predominantly of any of the following hydrocarbons or mixtures of them such as propane, propylene, butane, iso-butane, and butylene.

**Material Safety Data Sheet (MSDS)**—a written or printed material concerning a hazardous chemical/ material that is prepared in accordance with regulatory standards.



---

Provides important information about hazardous properties, first aid information, personal protective equipment, and disposal requirements.

**Multi-Employer Worksites**—more than one employer may be cited by a regulatory authority for hazardous conditions that violate a standard:

- Hoist employer—owner and/or operator of the site.
- Creating employer—the employer that causes a hazardous condition.
- Exposing employer—an employer whose own employees are exposed to a hazard.
- Correcting employer—the employer who is engaged in a common undertaking on the same worksite as the exposing employer and is responsible for correcting the hazard (examples include electricians maintaining electrical power supply for the project, labors performing jobsite cleanup for all contractors working at the site).
- Controlling employer—is the employer who has general supervisory authority over the worksite, including the power to correct safety and health violations itself or require others to correct them. In the absence of an explicit contractual provision, such authority is evidenced by the exercise of control in practice.

**OSHA Standards**—occupational safety and health standards or regulations (laws). Two types:

- Horizontal Standards—universal regulations that apply to many industries, such as 29 CFR 1910 General Industry.
- Vertical Standards—Specific industry standards such as 29 CFR 1926 Construction Standards.

Some people may believe that since they work for a construction company only OSHA 1926 standards apply. This is not the case; it depends on the work environment and corresponding exposures/hazards. If a heavy equipment repair shop is located on a construction site, the operation would most likely come under OSHA 1926 construction standards. However, if the equipment repair shop is centrally located and not on a construction site, it would probably fall under the OSHA 1910 general industry standards.



---

**Permissible Exposure Levels (PELs)**—Represent the legal (OSHA) maximum level of contaminants in the air of the workplace.

**Pyrophoric**—a chemical that will ignite spontaneously in air at a temperature of 130 degrees F or below.

**Qualified**—one who by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work or the project. Only persons designated "qualified" by the Regional Operations Vice President in consultation with the Company Safety Director will be considered as "qualified" as it pertains to safety and health matters.

**Reactive (unstable)**—a chemical in a pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure, or temperature.

**Responsible Care**—controlling employer exercising responsible care in discovering and preventing hazards:

- Conducts periodic inspections at appropriate frequency and conducts follow-up inspections as necessary
- Implements an effective system for promptly correcting hazards
- Enforces safety and health compliance over other worksite employers and employees

**Safety Can**—an approved closed container of not more than 5 gallons capacity, having a flash-arresting screen, spring closing lid and spout cover, and so designed that it will safely relieve internal pressure when subjected to fire exposure.

**Shall**—mandatory.

**Should**—recommended.

**Stop Log**—squared timbers that can be dropped into slots at either end of a lock or in a weir to stop the flow of water.



---

**Suitable**—means that which fits and has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

**Signals**—are moving signs provided by workers such as flag persons or by devices such as flashing lights that warn of possible or existing hazards.

**Signs**—are the warnings of hazards, temporarily or permanently affixed or placed at locations where hazards exist.

**Tags**—are temporary signs, usually attached to a piece of equipment or part of a structure, to warn of existing or immediate hazards.

**Threshold Limit Values (TLVs)**—similar to OSHA PELs developed by the American Conference of Governmental Industrial Hygienists (ACGIH). Refers to airborne concentrations of substances and represents an exposure level under which most people can work, day after day, without adverse effects.

- TLV-TWA is the Time Weighted Average concentration for a normal 8-hour day or 40-hour week.
- TLV-STEL is the Short-Term Exposure Limit and the limit that employees can be exposed for a time period of up to 15 minutes continuously without suffering irritation, chronic or irreversible tissue change or narcosis of sufficient degree to reduce reaction time, impair self-rescue or materially reduce work efficiency. No more than four 15-minute exposure periods per day are permitted, with at least 60 minutes between exposure periods.
- TLV-C is the ceiling concentration that should not be exceeded even instantaneously.

**Vapor Pressure**—pressure (measured in pounds per square inch absolute) exerted by a volatile liquid as determined by the "Standard Method of Test for Vapor Pressure of Petroleum Products- ASTM D-323-58.

**Will**—mandatory.



---

## **Austin Bridge & Road Hoisting Equipment Operation & Maintenance**

### **Appendix B: Guidelines for Supervisors**

No safety procedure can possibly cover all situations, and this procedure is no exception. There are three basic principles of crane safety.

1. Cranes and excavators are powerful complex machines and your complete attention to control the machine is required every minute.
2. The supervisor is the person responsible for all operations under his/her control and is the crucial key to safe machine performance.
3. Do not operate or allow to be operated any machine until the operator's manual is fully understood.

When a crane arrives at the jobsite, the supervisor shall make a safety inspection of the machine by checking sheaves, cable clamps, and all lifting and backstay arrangements.

Look for frayed cables, worn sheaves, pins, and other parts. Check for date of last annual inspection. The operator should check operating mechanisms such as brakes, hoisting levers controls, and other machinery. The supervisor is to ascertain the operator is proficient, has a current operator's card for the operation of the specific crane, has a current physical and drug test as well as being physically fit to operate the equipment.

4. The crane operator is required to demonstrate proficiency as outlined in this procedure under the guidelines entitled "Operator Proficiency Assurance," Appendix.
5. The crane operator is to undergo an annual medical evaluation and drug test to ensure his/her fitness to properly operate a crane and have a physical examination form completed by the examining physician. The physical evaluation form is to be filed with the Operator's personal file.



---

Make certain that the crane and rigging are capable of handling the load. Check capacity charts (a chart should be posted in the operator's cab). The capacity of the crane varies with boom length and the radius at which it is working. For example, a Model 12000 crawler crane with 60' of boom will pick 135,000 lbs. at a 20' radius. The same crane rigged in the same manner at 34' radius will safely pick up only 68,100 lbs. Increasing the radius by just 14' decreases the payload capacity by nearly 50%.

Keep the crane on a firm and level surface. If subsurface conditions dictate, proper ground compaction and/or crane mats must be used to improve subsurface conditions. If the crane is not level or is off balance, the load will be outside the boom alignment and places abnormal stresses on the boom. Capacity charts are no longer applicable under such conditions. Never side load a boom.

During wet or icy weather conditions, always have the operator check the brakes and hoisting mechanism of the crane before picking a crane has been idle for an extended period.

Statistics show that many crane accidents result from operating without authority or signals. Only one person is authorized to use and give standard signals to the operator. The signal person must have a clear and complete view of all boom and swing movements as well as the load. The signal person must be in clear view of the operator. Otherwise, a second signal person or two-way radios must be used to relay signals.

The operator is to make a lift only when signaled and only after all personnel are clear of the load and out of the line of swing. Loads should not be held for any prolonged length of time by the brake. "Dog" it off when possible or place blocking beneath the load. The operator shall not leave their position at the controls while a load is suspended from the boom.

Before handling heavy loads, determine that friction is tight before picking the load, and be sure the brakes will hold the load to be lifted. Raise the load off the ground a short distance and hold it long enough to test the rig. Never pick a load which causes the rear of the machine or outriggers to rise off the ground.

Before starting the lift, be certain that the load lines are plumb. If they are out of plumb, the load will swing to plumb position when lifted. This will result in a swinging load which





---

could strike employee-owners, structures, or the boom. Capacity charts would no longer be applicable in this case.

Ensure that the boom does not come into contact with or rest against any object causing it to deflect under the load. When swinging, determine that the boom will not come in contact with structures, guy lines, or other objects which may damage the boom.

The critical moment in lowering a heavy load is when the load is stopped. At that time, the equipment must withstand the inertia of the load as well as the weight.

When backing with a heavy load, remember that the inertia of the load tends to increase the radius - which affects lifting capacity.

Loads shall be guided with tag lines attached to the load and held by one or more persons on the ground to prevent swinging of load.

Loads will not be lifted during strong or gusting winds.

Booms will be lowered in storms. If caught in a sudden thunderstorm when there is not enough time or space to lower the boom on large cranes, the load line will be secured in an attempt to stabilize the boom. Remember, it is possible for the boom to act as a lightning rod and to be struck by lightning, so it is always preferable to lower the boom.

In some locations, and depending on the height of the boom, aircraft warning lights may be required.

When moving cranes onto or at the project job site, a flag person/spotter walks ahead of crane boom to prevent collision with other equipment or contact with overhead lines. A flag person/spotter to check the ground over which crane will move. Boom is to be kept low when traveling on unstable ground.

When changing the angle of the jib, lay boom out as flat as possible. Never boom up against boom stops or use the headache ball to raise the jib.

Swing radius protection is required on cranes to prevent someone from being "pinched" between the swinging upper unit of the crane and the stationary lower unit. This can be achieved by roping or barricading off the area around the crane.



---

When working in close quarters, a flagger or barricade shall be stationed at rear of crane to prevent anyone from being caught between the swinging counterweight and other obstructions, such as handrails, walls, etc.

Keep all wire rope tight and close together on the drum. If required to guide cable on drum of crane, never use your hands. Use a spud such conditions, make certain you have good footing.

Never hang any materials on the counterweight of crane to increase the lifting capacity. Makeshift arrangements of this type destroy the value of capacity charts. Many of the capacity charts on modern cranes are limited by structural capacity and not tipping.

Operator and supervisor shall check conditions when working near power lines. Where power cannot be cut off, a minimum distance of 20 feet must be maintained between equipment loads and power lines under 350kV. The minimum distance goes to 50 feet when power lines are rated over 350kV but under 1000kV. Consult the Safety Department when conditions are such that any part of the crane or load could become closer than the minimum distances set above or when power line voltages exceed 1000kV.

OSHA, State, and other regulations in various areas prohibit operation if boom or other part of crane is within varying distances of an electrical power source. These regulations should be checked prior to starting work.

Never hold on to or touch any part of crane or load when it is working near high voltage lines. If any part of the crane or load comes in contact with hot wires, both become energized.

In case of contact with the power line, the operator is to stay on his machine but make certain he touches nothing but the crane itself. Everyone else is to stay completely clear. The operator should free the crane from electrical contact, if possible, or the supervisor shall have the power shut off.



---

## **Austin Bridge & Road Hoisting Equipment Operation & Maintenance**

### **Appendix C: Crane Operator Guidelines**

The operator is responsible for the crane. The operator is expressly authorized and required to recommend that any lift or other activity which, in their opinion, is unsafe or which indicates improper use of the machine be stopped. This authorization is intended to authorize the operator, through the chain of command, to reach the senior site representative of the company prior to making such lift with no threat of reprisal.

The operator shall not leave the controls of the machine unattended at any time while the machine is in service.

No safety guidelines can possibly cover all situations, and this procedure is no exception. In addition to these guidelines, there are important facts that the operator must keep in mind. Cranes are powerful and complex machines that require your complete control every moment.

The operator, as the person responsible for the operations under their control, is the crucial key to safe machine performance.

No machine should be operated until the operator fully understands the operator's manual, has passed the Operator Proficiency Test, and has a current physical and drug test.

One of the most potentially dangerous situations in any workplace involves a mobile crane of unknown or incorrectly determined net capacity lifting a load of unknown or incorrectly determined weight.

Overloading is caused by four main problems:

1. Difficulty determining the load weight.
2. Load charts are non-standard and are complex.
3. Operators do not understand or are unable to understand or read and interpret load charts.



- 
4. Crane is not properly set up on firm level ground, and/or outriggers not properly extended.

Think safely. Follow the plan for inspection and safe operation. The operator should report or correct any unsafe condition immediately. Always place safety first. The operator must never take undue risks. A professional crane operator knows that a smooth, well-balanced work cycle gets more done and prevents machine wear and regrettable accidents.

The operator must never tamper with the safety devices or allow others to tamper with them.

Operators must inspect their machine daily and monthly, according to the “Crane Inspection Program”, Appendix E. They must check for loose, worn, or damaged parts. Report or correct any unsafe condition immediately. Never operate machine until corrections to unsafe conditions have been made. Lifting equipment, slings, and rigging must also be inspected daily. Discard lifting equipment such as chokers, slings, etc., when they become kinked, have broken strands or frayed fibers, or become worn because of abuse or length of service.

Replace all missing or broken guards. They are there to protect employees-owners.

Operators and/or riggers must visually inspect wire ropes daily and replace any that are worn, badly frayed, broken, or kinked. Be particularly careful about boom hoist ropes and pendants. Check end connections for wear.

The operator should always have a fire extinguisher on hand and know how to use it. Inspect at least once a month to determine working order. The operator must test all controls at the start of the shift to determine proper adjustment prior to starting work. The operator should make sure no one is working on or close to the machine prior to start up or movement. The operator should check inside, outside, and under the machine and use a signal person.

Employee-owners must use caution when fueling. Stop engine. Do not smoke. Never fill near an open flame. Keep metal funnels in contact with the filler tube to prevent static spark. Use only approved safety cans. Turn off any heaters prior to fueling. Never force gasoline out of drum or tank with compressed air. Service trucks should have external



---

ground connected to your equipment during refueling or an internally grounded hose connected to the fuel line nozzle. The operator should check their footing. The crane should be on solid, level base. Under some conditions, it may be necessary to build a solid base with compacted soil and/or mats.

Be alert; Operators should not be distracted. They should keep their eyes on a moving load. If they must turn their attention elsewhere, stop the machine first. If they cannot see the load, be sure to have a signal person in full view. Operators, riggers, and oilers should be good housekeepers. Keep the deck clean and free of oil, grease, rags, cables, chains, buckets, barrels, and other hazards. Keep loose parts in a toolbox. Be sure the operators' shoes are clean and dry before operating the brakes. Be careful of cleaning solvents because they can make the brakes slippery.

Use of a cell phone for anything but receiving lift signals is strictly forbidden while operating any crane.

Correct unstable ground where encountered. Never leave the machine in a low spot where rains may wash the footing away or flood the area.

When moving or traveling a crane:

1. Check bridges before crossing. machine. Make sure they will support the weight of the machine.
2. Always set swing brakes when crane is idle or holding loads for a period of time. If swinging is required during travel, engage jaw clutch before releasing brakes.
3. Never back up before determining everyone is clear of the machine and post a flag person/spotter.
4. For long moves, position boom in the direction of travel.
5. Always move with the load behind on soft surfaces. It helps to raise the leading end of crawler for safer traveling.
6. When traveling with a load, tie the load off to prevent swinging.
7. Check clearances under bridges, overhead lines, or any overhead obstructions. When side clearances are tight, post a flag person and be sure that there is clearance for tail swing.



- 
8. Lock the turntable before traveling on the highway. Use the hoist lock or swing brake and lower boom into rack to prevent swinging. When loading a crane on a trailer, always use ramps. If none are available, use blocking to build one.
    - a. Operate truck with lights on.
    - b. Use proper traffic warning flags and signs.
    - c. For large units, use front and/or rear escort vehicles.
    - d. Check local laws.

Travel with near-capacity loads as close to the ground as possible. Rubber-tired cranes are not allowed to travel with loads except when specifically allowed by the manufacturer and under strict guidelines.

Try never to swing over employee-owners and blow the horn when coming around with a load.

Do not get on or off a moving machine. Do not jump off. Use both hands and face the machine to mount and dismount. Take signals from only one person. When other signals are required, the operator and signal person shall agree on them beforehand.

When making adjustments or repairs:

1. Stop the machine.
2. Lower the boom. Secure it against dropping.
3. Neutralize all controls and use a Lock-out Tag-out procedure per items 4 and 5.
4. Lock starter. Remove the ignition key to make it inoperative.
5. Display proper warning signs on controls such as do not operate signs, tags, etc.
6. Keep hands, feet, and clothing away from gears, ropes, drums and sheaves.
7. Never place your hands on wire rope when climbing to top of the cab.
8. Use bar or stick to guide wire rope into drums.
9. Keep hands away from rotating parts and engine fans.
10. Safeguard your oiler and riggers. Do not resume operation until he/she gives you a positive "all clear" signal.



- 
11. Replace all guards and shields before resuming operations.
  12. Before disconnecting oil lines on machines with hydraulic controls, place the boom on the ground or on the boom rest. Move the controls to equalized pressures within the cylinders. Always release any air supercharged on the hydraulic reservoir and shut off the engine (or de-clutch pumps) before disconnecting the oil lines.

Block under boom before assembling or disassembling. Do not stand under the boom during work. If possible, do not work under or inside the boom during assembly or disassembly. When required to work within or under the boom, ensure that the boom is properly supported and secured. Assembly or disassembly will be performed under the direction and control of an Authorized Assembly/Disassembly Director.

Do not leave your machine while the engine is running. Stop all engines and engage all locking devices and brakes before leaving the crane.

No unauthorized person shall be allowed on or in the machine.

**Never travel with a load suspended from a jib or boom extension.**



---

## **Austin Bridge & Road Hoisting Equipment Operation & Maintenance**

### **Appendix D: Crane Operator Proficiency Assurance Examination**

#### **Objective**

This examination is designed to measure the knowledge of an employee-owner or job applicant in the requirements of safe crane operation.

The examination contained herein is to be administered by the person designated as the examiner. Results of this examination will be the basis for determining the applicant's skills as a safe crane operator in addition to any certifications that the operator may already possess.

#### **Pretest Checkout**

The Examiner should:

1. Determine experience, training, and physical condition of applicant.
2. Check references given on employment application.
3. Ensure that the applicant is at least 18 years of age.
4. Determine that crane is in safe working order and all required safety equipment is intact prior to testing applicant. (Examiner shall be familiar with OSHA Standard on Cranes -(CFR1926-Subpart CC)
5. Select an area for the test that is:
  - a. Away from the immediate work area.
  - b. Free from overhead energized power lines.

#### **Proficiency Review of Operations**

The examiner shall determine the applicant's ability to read boom capacity chart to select the:

1. Rated capacity of crane on which he is being tested.
2. Rated capacity of same crane when working with a 50-foot boom at a 25-foot radius.





- 
3. With a 15-foot jib on an 80-foot boom, what load can be lifted at a 30-foot radius?
  4. Determine if the applicant understands the difference between stability and structural capacity on the load chart.

General questions to be asked:

1. Lifting radius is figured between what two points?
2. When are outriggers used?
3. What would you do if your boom brake started to slip?
4. What would you do if your load brake slipped?
5. What would you do if the crane or load came in contact with electrical lines?
6. What points are lubricated daily?
7. How do you refuel crane - step-by-step?
8. When is a tag line used and why?
9. What do you need if work is within 20 feet of electrical lines or process pipes?

The examiner will give the following hand signals, and the applicant will tell him the meaning of each:

1. Stop
2. Emergency stop
3. Lower
4. Swing left and right
5. Boom up
6. Boom down
7. Travel
8. Cut left, cut right, hold and dog off

Operating test - each of the following shall be described and demonstrated correctly:

1. Enter the crane properly, including unlocking the door.



- 
2. Examine the machine and controls.
  3. Start the machine.
  4. Reading of gauges.
  5. Throw in master clutch.
  6. Raise and lower boom.
  7. Describe operation of boom hoist.
  8. Demonstrate lifting and lowering of load line and hook.
  9. Demonstrate lifting and lowering of whip line.
  10. Demonstrate how to lock brakes.
  11. Demonstrate emergency stop. Watch for reaction time.
  12. Swing right and left.
  13. Travel forward and backward.
  14. Cut right and left.
  15. Set and release brake.
  16. Describe the use of boom stop.
  17. Prepare crane for night parking.
  18. Dismount crane and lock door.

The Examiner should conduct a "hands on" actual operation of the equipment (crane) by having the operator perform the operations with the crane and documented on the Crane Operator Proficiency Assurance form. Complete and submit all Crane Operator Proficiency Assurance forms for each person hired as a crane operator to the DHSC.



---

# Austin Bridge & Road Hoisting Equipment Operation and Maintenance

## Appendix E: Crane Inspection Program

### Purpose

The condition of all cranes is important to the company from both a Safety and Maintenance viewpoint. This program will outline the required inspection, who is responsible for making the inspection, where the inspection report will be sent, and the follow-up requirements.

### Inspection Types

- Annual Inspection
- Monthly Wire Rope and Hook
- Daily Preventive Maintenance Shipping and Receiving
- Wire Rope Inspection

### Inspection Procedures

#### *Annual Inspection*

This inspection is required on an annual basis and will be performed by a third-party inspection firm selected by the Equipment Department. No crane will be operated unless it has a current annual inspection. The Equipment Superintendent or his designee will maintain a spreadsheet, which shows the Austin Bridge & Road “Equipment Number” for each crane in our fleet. This spreadsheet will show the date of the last annual inspection, the name of the firm that performed the inspection, when the next annual inspection is due, and any other information needed to ensure that cranes have a current annual inspection. The third-party inspection form will provide a window decal indicating that the inspection has been completed, the date of inspection, signature of inspector and company name. This sticker will NOT be applied until the crane has completely passed the inspection program and all repairs have been completed. In addition, a copy of the annual inspection report will be maintained in the Equipment Department’s master file.



---

### ***Responsibility***

The Equipment Superintendent will be responsible for scheduling the annual inspection for each of the cranes in our fleet. He will also verify that paperwork is complete, and copy is in the equipment yard's master file. He will provide the window decal to the operator when it is issued. The Crane Operator will be responsible for verifying that a current window decal is in place and legible.

### ***Monthly Wire Rope & Hook Inspection***

This inspection is required on a monthly basis while the crane is assigned to a project. The inspection will cover wire rope, both standing and running on the crane at the time of inspection. Additionally, the inspection will cover lifting hooks in use or in storage with the crane. Damage to either wire rope or lifting hooks will be noted on the inspection form. Particular care will be taken to ensure that the information is clear and others who may review the forms can easily understand any descriptions. One copy of each "Monthly Wire Rope & Hook Inspection" will be kept in the "equipment inspection file" at the job site, and one copy will be maintained in the master file at the Equipment Department.

### ***Responsibility***

The Crane Operator will be responsible for performing the "Monthly Wire Rope and Hook Inspection" for the crane they are operating. This inspection may require the boom to be lowered to allow access to the wire rope. Additionally, the Crane Operator will be responsible for the clarity and accuracy of the report. In the event that any wire rope or lifting hook that is in use is found to meet the criteria for removal/replacement as listed here-in, the Crane Operator will not operate the crane until it can be safely replaced. When a condition is found that requires replacement, the Crane Operator will shut down the equipment and notify the Project Superintendent. The Project Superintendent will call the Equipment Superintendent to advise him of the problem immediately. The Project Superintendent will review and sign the "Monthly Wire Rope and Hook Inspections", before forwarding a copy to the Equipment Department. One copy will be maintained in the job site "equipment inspection file."



---

The Equipment Superintendent will review the “Monthly Wire Rope & Hook Inspections,” schedule replacement of Wire Rope and Hooks that meet the replacement criteria, and forward the report to the Equipment Manager for insertion in the master file.

### ***Daily Preventive Maintenance Inspection***

The Operator, on a daily basis, will prepare the daily preventive maintenance inspection. This inspection is comprehensive and includes but is not limited to; checking for leaks; proper lubrication; operation of gauges, alarms, and safety devices; looking for wear in rollers, swing gears, and sheaves; checking load blocks, headache balls, and sheaves for damage and wire rope terminations; checking wire rope for wear, broken wires, proper reeving and spooling. This inspection must be documented on the “Preventive Maintenance Checklist” and forwarded to the equipment yard each Monday morning.

The form should be sent to the attention of the Equipment Superintendent by fax, and the original copy will be kept in the equipment file. The Project Superintendent for insertion in the project. “The Daily Preventive Maintenance Inspection” form must be filled out clearly so that maintenance personnel and others who review the form can understand problems or express concerns.

### ***Responsibility***

The Crane Operator is responsible for making the daily inspections and documenting them on the “Preventive Maintenance Checklist.” Additionally, the Crane Operator is responsible for the clarity and accuracy of the inspection report. When conditions are found during the daily inspection that could cause damage or create a hazard to the crane, job site, or employee-owners working on the job site, the Crane Operator is responsible for taking the crane out of service until repairs can be made.

The Crane Operator will notify the Project Superintendent, who will then call the Equipment Superintendent immediately when a condition is found that requires removal of a crane from service.

If the Crane Operator observes anything that in his opinion, should be checked by the Equipment Superintendent or an Equipment Mechanic immediately, the Crane Operator will notify the Project Superintendent, who will then call the appropriate personnel. If no



---

unsafe or questionable conditions are found, the operator should note that on the inspection form.

The Project Superintendent will review and sign the “Preventive Maintenance Checklist” before sending a copy to the Equipment Department and job file.

The Equipment Superintendent will review the “preventive maintenance checklist” and refer repairs needed to the Shop Foreman for scheduling. Following this review, a copy will be forwarded to the Equipment Manager for inclusion in the master files.

The Shop Foreman will schedule repairs to cranes based on the priority given by the Equipment Superintendent and shall furnish documentation to the Equipment Superintendent upon completion of the repairs.

### ***Shipping and Receiving***

This inspection will normally be performed as the crane is disassembled or loaded for shipment and as the crane is assembled at the project site. This allows the personnel to examine each part of the crane more closely than is possible when the crane is fully erected and operational.

The purpose of doing both the Shipping and Receiving inspection and reports is to allow a comparison of the two and identify damage sustained during shipping. See Appendix G for the proper form.

One copy of the Shipping and Receiving inspection forms will be maintained at the job site in the “equipment inspection file,” and one copy will be forwarded to the Equipment Manager for inclusion in the master file.

### ***Responsibility***

The Equipment Department personnel will perform and complete the “Shipping Report” on cranes being shipped from the equipment yard. Upon delivery, the Crane Operator at the job site will perform the “Receiving Report.” This inspection will be comprehensive so that conditions that exist at the time of shipping or receiving can be taken care of before the crane is placed in operation. When a crane is moved from one job site to another, the Crane Operator at the shipping job site will perform the “Shipping Report,” and the Crane Operator at the receiving job site will perform the “Receiving Report.”



---

The project Superintendent will review the Shipping and Receiving Reports before a copy is placed in the job file. A Competent Person (supervisor) will be present during the dismantling and assembly of cranes and may assist with these inspections. The Equipment Superintendent will review the shipping and receiving inspection for differences and identify how to resolve them. One copy of the “Shipping and Receiving” reports will be kept at the project site with the crane, and the Equipment Department will keep one copy in the master file.

### ***Annual Wire Rope Inspection***

The “Annual Wire Rope Inspection” will be performed approximately six (6) months after the “Annual Crane Inspection”. A third-party firm with expertise in wire rope inspections will perform this inspection. One copy of the inspection report will be maintained in the equipment inspection file at the job site. The Equipment Department will also maintain a copy in the master file.

### ***Responsibility***

The Equipment Superintendent or his designee will be responsible for scheduling the third party to perform the “Annual Wire Rope Inspection.” Additionally, the Equipment Superintendent will be responsible for forwarding copies to the job site and Equipment Department for inclusion in their respective files.

In the event that wire rope, either standing or running, is found to need replacement, the Equipment Superintendent will notify the project Superintendent immediately to remove the crane from service and schedule the required replacement.

The Crane Operator will be available during the annual wire rope inspection to operate the crane and assist with the inspection as needed.

### **Repair and Replacement Criteria**

#### ***Wire Rope***

When any of the following conditions are found during the inspection of a crane, the wire rope will be removed from service until it can be replaced.



---

### ***Broken Wires***

1. In running ropes, six (6) randomly distributed broken wires in one lay or three (3) broken wires in one strand in one lay.
2. 1 broken wire in the valley of rotation-resistant wire rope.
3. In standing ropes, more than two (2) broken wires in one lay in sections beyond end connections or more than one (1) broken wire at end connections.

### ***Wear***

1. In running ropes, wear 1/3 of the original diameter of the individual outer wires.
2. Reduction from nominal diameter of more than;
  - a. 1/64" for diameters up to and including 5/16"
  - b. 1/32" for diameters 3/8" to and including 1/2"
  - c. 3/64" for diameters 9/16" to and including 3/4"
  - d. 1/16" for diameters 7/8" to and including 1 1/8"
  - e. 3/32" for diameters 1 1/4" to and including 1 1/2"

### ***Other Damage***

1. Kinking, crushing, bird caging or any other damage resulting in distortion of the rope structure.
2. Evidence of heat damage from any cause
3. Corrosion

### ***Time and Service***

Based on the time of use and type of use of each wire rope, the Equipment Department will schedule replacement as needed. See SAE Standard J959, Appendix G. "Lifting-Crane Wire-Rope Strength Factors" for additional recommendations.

### ***Boom Sections***

When any of the following conditions are found during the inspection of a crane's lattice boom, it will be removed from service until it can be repaired or replaced. Qualified persons will only make repairs, in accordance with the manufacturer's instructions.





---

### **Main Chords**

1. Any damage to the main chords, including but not limited to:
  - a. Bends or dents
  - b. Any distortion in the shape of chord members

### **Lattice, Diagonal, and Picture Frame Members**

1. Bends, dents, or distortion when there is a crease in the member.
2. Misalignment by bow or bend (where no crease exists) where the misalignment is greater than the manufacturer's specifications.
3. Damage that causes the main chords to be distorted in any way.

### **Welds**

1. Cracked or broken welds
  - a. Welds that show signs of rust must be inspected to ensure no crack or break exists.

### **Hooks**

Hooks will be removed from service when any of the following conditions are found.

1. Deformation or cracks
2. Twist of 10 degrees or more from the plane of an unbent hook.
3. Throat opening in excess of 15% greater than new hook.

Note: Crane hooks will have operating safety latches while in service. Safety latch and pivot pin will be those required by the hook manufacturer.

### **Replacement Cranes**

In the event that a crane is removed from service for repairs in accordance with this policy, contact the Equipment Manager to schedule a replacement or substitute crane. In most cases, a crane can be provided from our fleet for the minimal amount of time needed to make repairs.



---

## **Audit of Program**

Periodically the DSHC will perform periodic audits of the crane inspection program. These audits will cover the inspection, documentation, and repair of cranes to ensure that the procedures set forth herein are being followed. Following the completion of the audit, a report will be forwarded to the Equipment Manager, with a copy maintained by the safety department. The Equipment Manager is responsible for implementing any corrections or changes required by the audits.



---

## Austin Bridge & Road

### Appendix F: Essential Field Forms

The following forms are available in HCSS. In the rare event you will not have internet access in the field, you may print these forms in advance to fill them out by hand. Scan the completed form and e-mail it to [abrsafety@austin-ind.com](mailto:abrsafety@austin-ind.com).

- [0-60 Incident Report](#)
- [Daily Pre-Shift Inspection-Asphalt Plants](#)
- [Confined Space Classification](#)
- [Confined Space Entry Permit](#)
- [Fall Protection Drawing Standards](#)
- [Non-Crane Power Line Permit](#)
- [AB&R Incident Report & Cause Analysis Investigation](#)
- [Project Excavation Checklist](#)
- [Pre-Construction Meeting Format](#)
- [Competent Person Form](#)



---

## **Austin Bridge & Road Section 27 - Hoisting Equipment Operation and Maintenance Policy**

### **Appendix G: CLP Safety Forms (SF)**

OPERATOR'S DAILY INSPECTION REPORT  
(SP29.001)

SHIPPING AND RECEIVING INSPECTIONS  
(SP29.002)

MONTHLY/ANNUAL WIRE ROPE INSPECTION  
(SP29.003)

LIFT PLAN CHECKLIST (SP29.004)

CRITICAL LIFTING PLAN (SP29.005)

MONTHLY HOOK INSPECTION (SP29.006)



### Operator's DAILY Inspection Report

SF SP29.001

Cranes: Crawler, Hydraulic, Truck Cranes

Preventive maintenance checks and services required by Section 5-2.1.2, "Frequent Inspections", of the ANSI B30.5 Code, are included. The less important machine components should be visually checked while proceeding through the checklist. Since this is a general guide, blanks are provided for the user to insert additional items that may require checking on some job applications. Any discrepancies should be recorded in the remarks section.

Equipment No. \_\_\_\_\_ Serial No. \_\_\_\_\_ Keep original with machine through week. Fax completed form to: Fort Worth Shop 817-284-8824

Operator: \_\_\_\_\_ Hour Meter Reading at the End of the Week: \_\_\_\_\_

Inspection for the Week Ending: \_\_\_\_ - \_\_\_\_ - \_\_\_\_

Job No.: \_\_\_\_\_ Last Annual Inspection: \_\_\_\_\_

The following "Preventive Maintenance Check List" is designed as a general guide to provide a systematic visual and physical inspection of the machine, before normal operation.

Daily Checks	Code:	S = Satisfactory	N= Needs Attention	U= Unsatisfactory				
No.	Check all applicable items daily	S	M	T	W	T	F	S
1	Oil or Coolant leaks below rotating bed or carbody							
2	Drive Chains and Sprockets for damage or obstruction							
3	Drain Water from Air System and Sumps							
4	Radiator coolant level							
5	Hoses, belts check for leaks and tightness							
6	Hydraulic oil level/Main Tank/SOM/Torque Converter							
7	Engine oil level							
8	Compressor oil level							
9	Hydraulic and Air Systems Controls for leaks							
10	Instrument Panel Gauges for proper operation							
11	Limit Switches and other Safety Devices, i.e. Swing Radius, Anti Two Block, etc.							
12	Horn, Boom Stops, Drum Pawls, Back-up Alarm, Fire Ext.							
13	Tires, Pressure, Damage (If Applicable)							
14	Hydraulic boom, lubricant, pins, jib mounts, damage							
15	Roller path, swing gears, roller for damage, lubricant							
16	Load block, ball, wire rope for damage, correct spooling							
17	Boom and jib for bent lacings, damaged sheaves and lubricate							
18	Hydraulic components for leaks or damage							
No.	Check all applicable items every week							
1	Transmission oil level							
2	Chain case oil level							
3	Swing, Travel, Rotating bed oil level							
4	Battery electrolyte level, Terminals clean and tight, Electrical wiring							

Check Levels  
Add oil when low

Check levels  
Add oil when low

Remarks:	Problem	Date Corrected	Corrected By	Operator

Operator: \_\_\_\_\_ Supervisor: \_\_\_\_\_



**CRANES—SHIPPING AND RECEIVING INSPECTION**

**SF SP29.002**

Equipment No.		Project No.		Location:	
Serial No.		Model		Description:	
Engine Hrs.	Miles	Parts Manual YES NO	Operations Manual YES NO		
Date		Date Received		Date Shipped Destination	

**OSHA INSPECTION CHECKLIST**

<u>ITEM</u>	<u>CHECK FOR</u>	<u>ITEM</u>	<u>CHECK FOR</u>
All Controls	Adjustment	Crane Hook	Cracks or Deformation
Air Controls	Wear and Contamination	Rope Reeving	Correctness
Air System	Leakage or Deterioration	Electrical Parts	Function Deterioration
	Safety Devices	Function	

Paint: New \_\_\_\_\_ Good \_\_\_\_\_ Need Paint \_\_\_\_\_ Need Cleaning \_\_\_\_\_  
Metal Condition: No Damage \_\_\_\_\_ Spot Rust \_\_\_\_\_ Need Repair \_\_\_\_\_  
Glass: Good \_\_\_\_\_ Broken \_\_\_\_\_  
Comments: \_\_\_\_\_  
Upper Engine Type \_\_\_\_\_ Needs Repair \_\_\_\_\_ Model \_\_\_\_\_  
Lower Engine Type \_\_\_\_\_ Needs Repair \_\_\_\_\_ Model \_\_\_\_\_  
Comments: \_\_\_\_\_  
Coding System Condition: Good \_\_\_\_\_ Needs Repair \_\_\_\_\_  
Needs Hoses \_\_\_\_\_ Needs Belts \_\_\_\_\_  
Radiator Core Condition: Good \_\_\_\_\_ Bad \_\_\_\_\_ Dirty \_\_\_\_\_ Clean \_\_\_\_\_  
Comments: \_\_\_\_\_  
Tires: Size \_\_\_\_\_ Tread Left % \_\_\_\_\_ Ply \_\_\_\_\_ Damage: Yes \_\_\_\_\_ No \_\_\_\_\_  
Comments: \_\_\_\_\_  
Tracks and Undercarriage Condition: \_\_\_\_\_  
Percent Wear \_\_\_\_\_  
Boom Type \_\_\_\_\_ Paint and Condition \_\_\_\_\_  
Damage and Inventory \_\_\_\_\_  
Jib Type \_\_\_\_\_ Paint and Condition \_\_\_\_\_  
Damage and Inventory \_\_\_\_\_  
Gauges Fuel \_\_\_\_\_ Amp \_\_\_\_\_ Temperature \_\_\_\_\_ Air \_\_\_\_\_ Oil \_\_\_\_\_  
Converter and/or Transmission Pressure \_\_\_\_\_ Shut Down Switches: Pressure \_\_\_\_\_ Oil \_\_\_\_\_  
Stairs: Good \_\_\_\_\_ Hard \_\_\_\_\_ Hydraulic Leaks \_\_\_\_\_ Oil Leaks \_\_\_\_\_  
Comments: \_\_\_\_\_  
Set Outriggers and Inspect: \_\_\_\_\_ Any Leaks \_\_\_\_\_  
Block Name \_\_\_\_\_ Capacity – Tons \_\_\_\_\_ Serial No. \_\_\_\_\_ Will  
Block Touch Ground with Boom Extended: Yes \_\_\_\_\_ No \_\_\_\_\_  
Ball Name \_\_\_\_\_ Capacity – Tons \_\_\_\_\_ Swivel \_\_\_\_\_ Hook \_\_\_\_\_  
Lights: All Good \_\_\_\_\_ Need Repair \_\_\_\_\_ Wire Condition \_\_\_\_\_  
Battery: Need Service \_\_\_\_\_ Needs Repair \_\_\_\_\_ Good \_\_\_\_\_ Size \_\_\_\_\_  
Stall Test After Running Inspection Test For 10 Seconds in Each Gear Forward and Reverse with Foot Brake On:  
Converter Pressure \_\_\_\_\_ lbs. Temperature \_\_\_\_\_ Degrees  
Did Brakes Hold? Yes \_\_\_\_\_ No \_\_\_\_\_ Explain: \_\_\_\_\_  
Upholstery \_\_\_\_\_ Fire Extinguisher \_\_\_\_\_ Back Up Alarm \_\_\_\_\_  
Cab Heater \_\_\_\_\_ Block Heater \_\_\_\_\_ Oil Tank Hydraulic Heater \_\_\_\_\_  
Did You Take Pictures? \_\_\_\_\_ Did You Swing 360 Degrees? \_\_\_\_\_  
Did You Travel More Than 50 Feet? \_\_\_\_\_ Has Machine Been Greased? \_\_\_\_\_  
Steering \_\_\_\_\_ Horn \_\_\_\_\_ Load Test, Date \_\_\_\_\_ Drain Air Tank \_\_\_\_\_  
Operator Control Identification \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Hand Signal Chart \_\_\_\_\_  
Load Charts \_\_\_\_\_ Including Jib \_\_\_\_\_ Warning Decals \_\_\_\_\_ Windshield Wipers \_\_\_\_\_  
Defroster Fan \_\_\_\_\_ Heater \_\_\_\_\_  
Crowd Cylinder \_\_\_\_\_ Outrigger Cylinder \_\_\_\_\_ Boom Hoist Cylinder \_\_\_\_\_  
Leaks \_\_\_\_\_ Check Valves \_\_\_\_\_ Operating Valves \_\_\_\_\_  
Catwalks \_\_\_\_\_ Hand Rails \_\_\_\_\_ Non-Skid Surfaces \_\_\_\_\_ Hand Holds \_\_\_\_\_  
Air Compressor \_\_\_\_\_ Operating Pressure \_\_\_\_\_ lbs. Leaks Yes \_\_\_\_\_ No \_\_\_\_\_  
Universal Joints \_\_\_\_\_ Drive Line \_\_\_\_\_ Tail Lights/ Stop Lights \_\_\_\_\_  
Air Cleaner \_\_\_\_\_ Oil Filters \_\_\_\_\_ Hydraulic Filters \_\_\_\_\_

# MONTHLY/ANNUAL WIRE ROPE INSPECTION

**SF SP29.003**

EQUIPMENT NO. \_\_\_\_\_ (This Sheet may be used for monthly mandatory inspections)

DATE: \_\_\_\_\_

**INSTRUCTIONS**

**GENERAL:**

1. All servicing, maintenance and inspections specified by the manufacturer are to be completed at the interval recommended in the Owner's Manual. Note: A√ on the "MANUFACTURES RECOMMENDATION" line in each section will indicate compliance.
2. All items and areas in the MONTHLY section of this Record must be completed at least once a month or more often if required because of special operating conditions and/or the Manufacturer's recommendations – see paragraph 1 above.

**ROPES:**

1. Wire rope shall be taken out of service when any of the following conditions exist:
  - I) In running ropes, six randomly distributed broken wire in one lay or three broken wires in one strand in one lay;
  - II) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope;
  - III) Evidence of any heat damage from any cause;
  - IV) Reductions from nominal diameter of more than 1/64<sup>th</sup> of an inch for diameters up to and including 5/16<sup>th</sup> of an inch, 1/32<sup>nd</sup> of an inch for diameters 3/8<sup>th</sup> of an inch to and including 1/2 of an inch, 3/64<sup>th</sup> of an inch for diameters 9/16<sup>th</sup> of an inch to and including 3/4<sup>th</sup> of an inch, 1/16<sup>th</sup> of an inch or diameters 7/8s of an inch to 1 1/8 inches inclusive, 3/32nds of an inch for 1 1/4 to 1 1/2 inclusive;
  - V) In standing ropes, more than two broken wires in one lay in sections beyond end constructions or more than one broken wire at an end connection.
  - VI) Wire rope safety factors shall be in accordance with American National Standards Institute B30.5-1968 or SAE J959-1966.

Following excerpt from OSHA 1926.550 (a) (7)

2. If inspection indicates that continued use of any of the ropes would constitute a safety hazard, circle the "ROPE" (line) description in each column respectively and complete the following "Rope Replacement Record". (For example, if the load line inspection identified a safety hazard, then draw a circle around the column title "Load Line" and input replacement date).

**ROPE REPLACEMENT RECORD**

	Load Line	Whip or Runner Line	Boom Hoist	Back hitch Suspension	All Pendants	All Other
Inspection this Month Indicates the Following Check <input type="checkbox"/> One						
1. Satisfactory	_____	_____	_____	_____	_____	_____
2. Replace	_____	_____	_____	_____	_____	_____
Enter Dates if Replaced	_____	_____	_____	_____	_____	_____

**INSPECTOR** \_\_\_\_\_



## Lift Planning Check List

Object: \_\_\_\_\_

Date: \_\_\_\_\_

Location/Structure: \_\_\_\_\_

Crane: \_\_\_\_\_

Weather Conditions

Anticipated Date: \_\_\_\_\_

Temp \_\_\_\_\_

Prepared By: \_\_\_\_\_

Lighting \_\_\_\_\_

Weight of load with rigging (hook down) \_\_\_\_\_

Precip. \_\_\_\_\_

Weight of blocks, balls, jib & extra cable \_\_\_\_\_

Wind \_\_\_\_\_

Total Load to be lifted \_\_\_\_\_

Max radius of Crane (lifting or setting) \_\_\_\_\_

Chart capacity of crane at max radius \_\_\_\_\_

75% of chart capacity (capacity X 3 ÷ 4) \_\_\_\_\_

Is the lift Critical? (Yes to any question constitutes a critical lift requiring a critical lift plan)	Yes	No
Is weight of the load greater than 75% of the rated capacity of crane at planned max operating radius?	<input type="checkbox"/>	<input type="checkbox"/>
Does the lift require the use of more than one crane to complete the lift?	<input type="checkbox"/>	<input type="checkbox"/>
Is the weight of the load more than 50 Tons?	<input type="checkbox"/>	<input type="checkbox"/>
Would damage to the load significantly affect the work schedule?	<input type="checkbox"/>	<input type="checkbox"/>
Will the lift be over or within 20 feet of power lines less than 350kV?	<input type="checkbox"/>	<input type="checkbox"/>
Will the lift be over or within 50 feet of power lines greater than 350kV?	<input type="checkbox"/>	<input type="checkbox"/>
Does the lift involve the use of a personnel basket?	<input type="checkbox"/>	<input type="checkbox"/>
Does the lift involve non-routine rigging or operational procedures?	<input type="checkbox"/>	<input type="checkbox"/>
Has the customer, engineer, lift director or other supervisor deemed the lift to be critical?	<input type="checkbox"/>	<input type="checkbox"/>
If Yes to any of the above questions, has a critical lift plan been made a part of this plan? (Do not proceed with critical lift until the critical lift plan is complete and made a part of the lift planning check list)	<input type="checkbox"/>	<input type="checkbox"/>

Pre-Lift Check List (Do not proceed with lift without appropriate check in each line)	Yes	N/A
Is the crane's supporting surface stable, compact and level?	<input type="checkbox"/>	<input type="checkbox"/>
Are proper pads, mats, cribbing and/or blocking in place and adequate?	<input type="checkbox"/>	<input type="checkbox"/>
Are all outriggers fully extended?	<input type="checkbox"/>	<input type="checkbox"/>
Is the crane within 1% of level in all directions with all weight off of tires?	<input type="checkbox"/>	<input type="checkbox"/>
Are the load chart, signal chart and crane manual in/on crane?	<input type="checkbox"/>	<input type="checkbox"/>
Is swing radius protection in place and personnel instructed of hazards?	<input type="checkbox"/>	<input type="checkbox"/>
Have the swing path and vertical clearances been checked for path of load?	<input type="checkbox"/>	<input type="checkbox"/>
Has the Qualified Rigger been designated and placed in charge of rigging the load?	<input type="checkbox"/>	<input type="checkbox"/>
Are all lifting devices and rigging of sufficient capacity for the load?	<input type="checkbox"/>	<input type="checkbox"/>
Have all lifting devices & rigging been inspected and found to be in safe working condition?	<input type="checkbox"/>	<input type="checkbox"/>
Is proper tag line attached to the load and of sufficient diameter and length to control load?	<input type="checkbox"/>	<input type="checkbox"/>
Have the signals and communications been discussed and agreed to?	<input type="checkbox"/>	<input type="checkbox"/>
Has the Qualified Signalperson been assigned and all documentation for signalperson checked?	<input type="checkbox"/>	<input type="checkbox"/>
Fall protection in place and personnel instructed in hazards?	<input type="checkbox"/>	<input type="checkbox"/>
Have RR flagmen been contacted and tracks cleared for lift?	<input type="checkbox"/>	<input type="checkbox"/>



# CRITICAL LIFT PLAN

SF SP29.005

## Plan Contents Checklist

Yes	N/A	Description of Lift Plan Component
		Critical Lift Planning Checklist
		Lift Analysis Report
		Job Hazard Analysis (JHA)
		Copy of Crane(s) Load Chart
		Copy of Vendor's Charts showing capacity of Slings and Shackles
		Copy of Inspection Reports for Crane(s) and Rigging
		Plan View Drawings
		Elevation View Drawings
		Engineering Calculations for Engineered Lifting Components
		Engineering Soil Test Reports of Crane Setup Area
		Routing Sketch of Equipment Travel to Pick Points
		Lift Planning Check List (ABR form #)
		Other (list)
		Lift Approval and Sign-off Sheets (also used as Cover Sheet)

# CRITICAL LIFT PLAN

**SF SP29.005**

## Critical Lift Planning Checklist

The following checklist will be filled out by the planners of the critical lift to ensure thoroughness and completeness of plan. Reviewers of the lift plan are encouraged to use this list to ensure that all aspects of the lift have been thoroughly addressed in the plan presented to them for review.

ITEMS TO ADDRESS WHEN PLANNING A CRITICAL LIFT	YES	N/A
Have the weights of the item(s) been calculated or assured with appropriate factors of safety as per the Austin Crane Policy? (Section 29 of Safety and Health Manual)		
Have all appurtenances been considered in the weight calculations?		
Has all the rigging hardware been included in the weight calculations?		
Is the minimum clearance between the load and the boom during the lift sufficient?		
Has the center of gravity been determined by a qualified person, and is it marked on the load?		
If the radius was calculated, has it been double-checked by measuring in the field?		
Has a qualified and competent person been designated as the Lift Director for this lift?		
If radios are required, have they been checked for adequacy, channel, and charge?		
Is there anything inside the lift that could shift during the lift?		
Is the load fragile enough to require lifting from a "strongback" or from multiple attachment points? If so, has the strong back been designed by a competent engineer and load-tested?		
Will the crane load change as the lift progresses? (during setting of loads with two cranes)		
Has the anchor bolt pattern been checked to confirm the load can be landed properly?		
Is the surface area large enough to create unusual control problems in the wind?		
Have all rigging hardware been selected to work within the manufacturer's limits?		
Have sling angles flatter than 45 degrees been avoided, and the slings or changes been chosen to all for higher loads due to sling angle?		
Is the rigging arranged to have the crane hook directly over the load's center of gravity with the load hanging level or as required for setting?		
Have softeners been specified to protect the rigging where sharp corners could cause damage?		
Does the rigging provide positive control of the load to prevent slipping or shifting?		
Are shackles or hooks always used in such a manner as to avoid side bending in the hardware?		
Will spreaders and other rigging hardware remain safely clear of the boom, the load and other objects at all times during the lifting operation?		
Have qualified personnel designed and tested special rigging hardware in accordance to regulations?		
Have shackle pins been checked to fit the holes provided in the lifting lugs?		
Are the dimensions of the lifting lugs/pad-eyes consistent with the size of shackle proposed such that the shackle will be able to turn s the load goes from horizontal to vertical?		
Have the appropriate impact factors been used in designing the lifting lugs, shackles, etc.?		

# CRITICAL LIFT PLAN

**SF SP29.005**

## Critical Lift Planning Checklist (continued)

<b>ITEMS TO ADDRESS WHEN PLANNING A CRITICAL LIFT</b>	<b>YES</b>	<b>N/A</b>
Has any required non-destructive testing been done to assess the quality of welds attaching lifting lugs, pad-eyes, etc.?		
Is there enough room between the lifting lug/pad-eye hole and the surface to which the lug/pad-eye is attached to allow the nut or keeper pin to be placed in the shackle pin?		
Do the lifting and swing areas require additional barricades? If so, are they located on the plans, and have they been checked?		
Have the limits on wind speed and location of measurements on wind speed been established?		
Have the walking paths of cranes been delineated on the ground with flags or paint with intermediate positions as necessary during the walking sequence?		
Have all necessary outside notices been given and permits applied for and received?		
Has the load transport route to the lift site been checked for overhead obstructions?		
Has the load transport route to the lift site been checked for existing bridges, culverts, or other buried utilities and found to be sufficient for the loads? Is additional shoring required?		
Has the Safety Department been involved in the lift planning process or lift plan review?		
Have all obstructions in the lift path and swing path been identified, and measures taken to protect or sufficiently avoid/clear the obstructions?		
Is the soil bearing capacity adequate to safely support the maximum load to be imposed by the crane? Has the use of crane mats been determined to be necessary in these soil conditions?		
Have the crane assembly site and the route for the crane been determined and identified in plan?		
Is the site adequate to accommodate fully extended outriggers for the crane to be used?		
Has the safe disconnection of the lifting slings once the load is landed and anchored been addressed?		
Is adequate lighting equipment available for use if the lifting operation should extend beyond normal daylight hours?		
Can rigging personnel safely control and manipulate the load throughout the lifting path?		
If power lines are within the work area, have offsets been established by elevated warning lines or barricades?		
If power lines are present, have all policies and regulations been complied with, including OSHA CFR1926.1407 through 1411?		

# CRITICAL LIFT PLAN

**SF SP29.005**

Lift Analysis Report - Cranes			
<b>Location:</b>			
<b>Description of Item:</b>			
<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Weight (incl 10% on theoretical)</b>
Is weight estimated?	Yes   No	By who?	
Is weight documented?	Yes   No	How?	
<b>Type of Crane(s) and Crane Configuration(s)</b>			
<b>Primary Lift Crane</b>		<b>Secondary (Tail) Crane</b>	
Crane Make & Capacity:		Crane Make & Capacity:	
Boom Length:		Boom Length:	
Jib Length:		Jib Length:	
Boom extension Length:		Boom extension Length:	
TOTAL BOOM LENGTH:		TOTAL BOOM LENGTH:	
Maximum radius as verified in field:		Maximum radius as verified in field:	
Boom angle at Pick:		Boom angle at Pick:	
Boom angle at Set:		Boom angle at Set:	
Jib Offset (degrees)		Jib Offset (degrees)	
Parts of line to be used:		Parts of line to be used:	
Capacity of each part:		Capacity of each part:	
Maximum line pull:		Maximum line pull:	
<b>Chart capacities at severest lifting condition</b>		<b>Chart capacities at severest lifting conditions</b>	
Over front capacity:		Over front capacity:	
Over side capacity:		Over side capacity:	
Over rear capacity:		Over rear capacity:	
360 rotation capacity:		360 rotation capacity:	
<b>Crane Gross Capacity (Max Available Capacity)</b>		<b>Crane Gross Capacity (Max Available Capacity)</b>	
<b>at above configuration:</b>		<b>at above configuration:</b>	
How will the lift be completed?			

# CRITICAL LIFT PLAN

**SF SP29.005**

## Lift Analysis Report - Rigging

Primary Lift Crane Rigging					
Type	Quantity	Size	Length	Cap. Lbs/Tons	Total Weight
_____ Slings					
Shackles					
Snatch Blocks					
Spreader Bars					
Lifting Beams					
Other					

Hitch Arrangement	Total Capacity	Lbs/Tons	Degrees of Angle
Single Vertical			
_____ Leg Bridle (sling)			
Single Basket			
Double Basket			
Double Wrap Basket			
Single Choker			
Double Choker			
Double Wrap Choker			
Special			

Secondary (Tail) Lift Crane Rigging					
Type	Quantity	Size	Length	Cap. Lbs/Tons	Total Weight
_____ Slings					
Shackles					
Snatch Blocks					
Spreader Bars					
Lifting Beams					
Other					

Hitch Arrangement	Total Capacity	Lbs/Tons	Degrees of Angle
Single Vertical			
_____ Leg Bridle			
Single Basket			
Double Basket			
Double Wrap Basket			
Single Choker			
Double Choker			
Double Wrap Choker			
Special			

**NOTE: Include:**

1. Diagram for each rigging system
2. Calculations for sling angles and stress per leg

# CRITICAL LIFT PLAN

SF SP29.005

## Lift Analysis Report – Weight Calcs.

Capacity Deductions		
Component	Primary Lift Crane – Lbs/Tons	Secondary Lift Crane – Lbs/Tons
Main Block		
Auxiliary Ball		
Jib-Stowed		
Jib-Erected		
Rigging		
Auxiliary Boom Point-rooster tail		
Loadline/Whipline		
Other (specify)		
Total capacity (weight) deduct		

Final Calculations		
	Primary Lift Crane – Lbs/Tons	Secondary Lift Crane – Lbs/Tons
Crane Gross Capacity		
Minus Deductions		
Equals <b>Net Capacity</b>		
Weight or Load		
Divided by Net Capacity x 100 Equals <b>Percent of Load Chart</b>  <b>MUST BE ≤ 90%</b>		

- Maximum Wind Speed Allowed for lift to proceed: \_\_\_\_\_
- Type and capacity of Weakest part of Rigging: \_\_\_\_\_
- Lifting over obstacles out of sight to operator? Yes/No Approval: \_\_\_\_\_
- Lifting over traffic or high risk structures? Yes/No Approval: \_\_\_\_\_
- Lifting within 50 feet of power lines? (requires plan) Yes/No Approval: \_\_\_\_\_

# CRITICAL LIFT PLAN

SF SP29.005

## Lift Approval and Sign-off Sheet

### GENERAL INFORMATION ON LIFT

Project Number: \_\_\_\_\_

Description of Lift: \_\_\_\_\_

Plan Developed By: \_\_\_\_\_



### Contractor's Review and Approval

Lift Director: \_\_\_\_\_

Rigging Foreman: \_\_\_\_\_

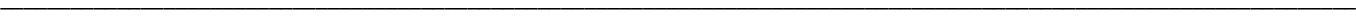
Operator: \_\_\_\_\_

Operator: \_\_\_\_\_

Superintendent: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Description of Lift: \_\_\_\_\_



### Review and Concurrence (if required)

Client Representative: \_\_\_\_\_

Client Safety Representative: \_\_\_\_\_



### Pre-Lift Safety Meeting

Lift Director: \_\_\_\_\_

Rigging Foreman: \_\_\_\_\_

Operator: \_\_\_\_\_

Operator: \_\_\_\_\_

Work Crew Members:	

# MONTHLY HOOK INSPECTION

SF SP29.006

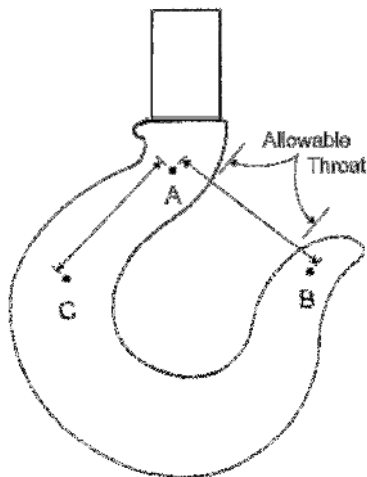
DATE: \_\_\_\_\_

Use center punch marks for A, B, C.

UNIT NO: \_\_\_\_\_

MODEL: \_\_\_\_\_ S/N: \_\_\_\_\_

## MAIN HOIST HOOK



Measurement A.C. \_\_\_\_\_

Tram Point Measurement A.B. \_\_\_\_\_

Difference A.B. and A.C. \_\_\_\_\_

Load Block Serial No. \_\_\_\_\_

Date \_\_\_\_\_

Allowable Throat Opening \_\_\_\_\_

## AUXILIARY HOIST HOOK

Measurement A.C. \_\_\_\_\_

Tram Point Measurement A.B. \_\_\_\_\_

Difference A.B. and A.C. \_\_\_\_\_

Auxiliary Hoist Block Serial No. \_\_\_\_\_

Date \_\_\_\_\_

Allowable Throat Opening \_\_\_\_\_

Hooks are to be checked at least once per month and after every major lift.

### INSPECTION CRITERIA:

Crane hooks with deformations or cracks. Hooks with cracks or having more than fifteen (15) percent in excess of new throat opening or any degree of twist from the plane of the unbent hook are not to be used. Point AC should measure the same as point AB.\*

### INSPECTED by

Signature: \_\_\_\_\_

\*Example: If new throat opening is 5" and AB and AC are 7" then throat opening cannot exceed 5.75" (5 3/4 inches) so AB cannot ever exceed 7.75" (7 3/4 inches).





---

## Austin Bridge & Road

### Section 27 Crane Hoisting Operation and Maintenance Policy

#### Appendix H: Cranes and Derricks in Construction 29 CFR 1926 Subpart CC

#### Review of New OSHA Regulations Relating to the Use of Cranes and Derricks in the Construction Industry

The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) released a historic new standard addressing the use of cranes and derricks in construction and replacing a decades-old standard. The significant number of fatalities associated with the use of cranes and derricks in construction and the considerable technological advances in equipment since the publication of the old rule, issued in 1971, led the Labor Department to undertake this rulemaking.

In 1998, OSHA's expert Advisory Committee on Construction Safety and Health (ACCSH) established a workgroup to develop recommended changes to the current standard for cranes and derricks. In December 1999, ACCSH recommended that the Agency use negotiated rulemaking to develop the rule. The Cranes and Derricks Negotiated Rulemaking Committee (C-DAC) convened in July 2003 and reached a consensus on its draft document in July 2004. In 2006, ACCSH recommended that OSHA use the C-DAC consensus document as a basis for OSHA's proposed rule, which was published in 2008. Public hearings were held in March 2009, and the public comment period on those proceedings closed in June 2009.

1. The rule becomes effective November 8, 2010, which is 90 days after August 9, 2010, the date the final rule was published in the *Federal Register*. Certain provisions have delayed effective dates ranging from 1 to 4 years.
2. The final rule was published on August 9, 2010, by the Federal Register, and can be found at <https://www.osha.gov/laws-regs/federalregister/2010-08-09>.
3. A copy of the regulatory text is available at:  
<https://www.osha.gov/sites/default/files/cranesreg.pdf>
4. This new standard will comprehensively address key hazards related to cranes and derricks on construction worksites, including the four main causes of worker



---

death and injury: electrocution, crushed by parts of the equipment, struck by the equipment/load, and falls.

5. Significant requirements in this new rule include a pre-erection inspection of tower crane parts, the use of synthetic slings in accordance with the manufacturer's instructions during assembly/disassembly work, the assessment of ground conditions, the qualification or certification of crane operators, and procedures for working in the vicinity of power lines.
6. This final standard is expected to prevent 22 fatalities and 175 non-fatal injuries each year.
7. Several provisions have been modified from the proposed rule. For example:
  1. Employers must comply with local and state operator licensing requirements which meet the minimum criteria specified in 1926.1427.
  2. Employers must pay for certification or qualification of their currently uncertified or unqualified operators.
  3. Written certification tests may be administered in any language understood by the operator candidate.
  4. When employers with employees qualified for power transmission and distribution are working in accordance with the power transmission and distribution standard (1910.269), that employer will be considered in compliance with this final rule's requirements for working around power lines.
  5. Employers must use a qualified rigger for rigging operations during assembly/disassembly.
8. Employers must perform a pre-erection inspection of tower cranes.
9. This final rule requires operators of most types of cranes to be qualified or certified under one of the options set forth in 1926.1427. Employers have up to 4 years to ensure that their operators are qualified or certified unless they are operating in a state or city that has operator requirements. If a city or state has its own licensing or certification program, OSHA mandates compliance with that city



---

or state's requirements only if they meet the minimum criteria set forth in this rule at 1926.1427.

10. The certification requirements in the final rule are designed to work in conjunction with state and local laws.
11. This final rule clarifies that employers must pay for all training required by the final rule and for certification of equipment operators employed as of the effective date of the rule.
12. State Plans must issue job safety and health standards that are “at least as effective as” comparable federal standards within 6 months of federal issuance. State Plans also have the option to promulgate more stringent standards or standards covering hazards not addressed by federal standards.
13. OSHA will have additional compliance assistance material available within the next month.

This is a major overhaul of the existing regulations and combines information and regulations relating to the use and operation of cranes in one place within the Code of Federal Regulations. Many of the existing regulations have or will be revised to avoid duplication upon the full implementation of this new rule.

The following review is meant to condense the 273 pages of the official Federal Register document and highlight and simplify most of the key components that will affect Austin after November 8, 2010.

The full version of the Federal Register regarding 29 CFR 1926 – Cranes and Derricks in Construction; Final Rule is attached for further information, study, and reference.

The first 226 pages go over the entire process in which the development of the standard came about, including some very enlightening information as to the intent of the standard with regard to many of the paragraphs. It also details the analysis made to determine the return on investment for requiring these changes in the industry.

Page 226 is the start of the actual amendment, changing existing paragraphs within 29 CFR 1926, and the beginning of the new Subpart CC – Cranes and Derricks in



---

Construction begins on page 231. It is these last 43 pages that have been summarized for better dissemination below.

Should there be any questions, you can contact your supervisor and/or Safety or Engineering Departments for further interpretation and understanding of this major new regulation and how it affects the policies of Austin Bridge & Road.

### **Key Definitions**

**Authorized Person (1926.32(d))** – A person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.

**Assembly/Disassembly Director (1926.1404)** – An individual who meets this subpart’s requirements for an A/D Director, irrespective of the person’s formal job title or whether the person is non-management or management personnel. Both competent and qualified 1926.1404(a).

**Assembly/Disassembly (1926.1401)** – Means the assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, “erecting and climbing” replaces the term “assembly,” and “dismantling” replaces the term “disassembly.” Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.

**Certified Operator (1926.1427)** – Required for cranes exceeding the capacity of 2,000 pounds, Option 1 Certification - by an Accredited Crane Operator Testing Organization. (Three other options are available but are not viable or applicable to Austin.) *Effective Date: 8 Nov 2014*

**Competent Person (1926.32(f) and 1926.1401)** – One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.

**Dedicated Pile-Driver (1926.1401)** – Is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.



---

***Dedicated Spotter (power lines) (1926.1401)*** – To be considered a dedicated spotter, the requirements of 1926.1428 (Signal person qualifications) must be met, and his/her sole responsibility is to watch the separation between the power line and: the equipment, load line and load (including rigging and lifting accessories) and ensure through communication with the operator that the applicable minimum approach distance is not breached.

***Dismantling (1926.1401)*** – Includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).

***Fall Zone (1926.1401)*** – Means the area (including but not limited to the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.

***List (1926.1401)*** – Means the angle of inclination about the longitudinal axis of a barge, pontoons, vessel, or other means of floatation. *This differs from the list of a crane, which is measured through the bottom pin of the boom.*

***Nationally Recognized Accrediting Agency (1926.1401)*** – Is an organization that, due to its independence and expertise, is widely recognized as competent to accredit testing organizations. Examples of such accrediting agencies include but are not limited to, the National Commission for Certifying Agencies and the American National Standards Institute.

***Overhead and Gantry Cranes (1926.1401)*** – Includes overhead/bridge cranes, semi-gantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means.

***Qualified Evaluator (not a third party) (1926.1401)*** – Means a person employed by the signal person's employer who has demonstrated he/she is competent in accurately assessing whether individuals meet the Qualification Requirements for a Signal Person.

***Qualified Person (1926.32(m) & 1926.1401)*** – Who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated his/her ability to solve or resolve problems relating to the subject matter, the work, or the project.



---

**Qualified Rigger (1926.1401)** – is a rigger who meets the criteria for a qualified person.

**Rated Capacity (1926.1401)** – Means the maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configurations, radial, boom length, and other parameters of use.

**Runway (1926.1401)** – Means a firm, level surface designed, prepared, and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane-suspended platform. An existing surface may be used as long as it meets these criteria.

**Maintenance, Inspection, and Repair Employees (1926.1429)** – Do not have to be certified but are limited to necessary operation only and may have to be assisted by the Operator.

**Signal Person (1926.1428(c))** – Meets the qualification requirements of either a third-party evaluator or an employee's evaluator and provides documentation of that determination. This documentation must show what type of signaling (hand, radio, etc.) for which the signal person meets the requirements.

**Trim (1926.1401)** – Means angle of inclination about the transverse axis of a barge, pontoons, vessel, or other means of floatation.

## **Key Points of the new Subpart CC (Summarized – consult full document)**

### **Scope of Regulation (1926.1400)**

1. Applies to construction equipment that can hoist, lower, and horizontally move a suspended load.
2. Excludes:
  1. Excavators, wheel loaders, backhoes, and track loaders
  2. Concrete pump trucks
  3. Manlifts and other Aerial Personnel Lifts
  4. Forklifts
  5. Mechanic's trucks when used in maintenance and repair.



- 
6. Machinery that hoists by come-a-long or chain fall.
  7. Dedicated drill rigs
  8. Boom Trucks only when delivering manufactured materials (with restrictions)
3. Does not apply to cranes on rail for work on railroad and covered by Federal Railroad Administration under 49 CFR part 213.

***Assembly/Disassembly (1926.1404)***

1. Supervision – This is the Assembly/disassembly. The Director and has to meet both definitions of Competent and Qualified.
2. The A/D director must understand the applicable assembly/disassembly procedures.
3. The A/D director must review the procedures immediately prior to the procedure unless that person has performed this task on the same type and configuration of crane, including accessories.
4. The A/D director must conduct a JHA with the crew, including specific assignments and hazards.
5. The A/D director must ensure proper communication between the operator and those out of the operator's sight.
6. No one is to work under the boom, jib, or other components during pin removal (if absolutely necessary, special cribbing or other provisions should be made)
7. All capacity limits are not to be exceeded.
8. The A/D director must consider all hazards, including:
  1. Site and ground bearing conditions
  2. Blocking materials and location of blocking
  3. Verification of loads, including the assist cranes, if any
  4. Boom and jib pick points.
  5. Centers of gravity for picks



- 
6. Stability of components upon pin removal
  7. Snagging
  8. Pinch points and caught between hazards, including counterweights.
  9. Boom hoist brake failure potentials (testing brakes necessary)
  10. Stability during assembly or disassembly (too much boom or counterweight)
  11. Wind and environmental considerations.
  9. Must verify how much cantilevered boom can be installed with a particular configuration.
  10. All weights must be known.
  11. Inspection in accordance with 1926.1412(c) must be completed by a qualified person after assembly is complete.
  12. No jibs allowed for pile driving rigs.
  13. Outriggers, appropriately fill out (unless allowed by Manufacturer), load off of wheels and supported.
  14. Rigging for assembly/disassembly by Qualified Rigger

***Disassembly (1926.1405) – additional requirements for dismantling of booms and jibs (Changing of boom lengths)***

Set of specific cautions related to removal of pins from booms or jibs.

***Assembly/Disassembly (1926.1406) – employer procedures***

Only regarding procedures developed by the employer instead of manufacturer's procedures – not applicable to Austin in most cases.

***Power Line Safety (up to 350 kV) (1926.1407) – assembly and disassembly***

No assembly/disassembly of cranes is allowed below power lines or within the clearances provided in Table A of 1926.1408.

1. Hazard assessment prior to beginning work.





- 
1. Identify the work zone by physically marking the limits of the crane assembly. *(that is the area in which the crane and attachments will occupy at ground level throughout the assembly or disassembly of the crane)*
  2. Determine if any part of the crane, load line, or load (including rigging and lifting accessories) could get, in the direction or area of assembly/ disassembly, closer than 20 feet to a power line. If so, it must meet the requirements of one of three options.
    - i) Option 1 – De-energize and ground the power line. Must be confirmed to be de-energized and visibly grounded.
    - ii) Option 2 – Maintain 20 feet clearance by implementing measures specified in (b) below.
    - iii) Option 3 – Conform to Table A (see 1926.1408) Clearances and implement measures specified in (b) below.
- 2.** Positive prevention of encroachment/electrocution is required with the use of options 2 or 3 and include all of the following:
1. A pre-planning meeting is to be conducted with all workers involved with the operation to take place.
  2. Tag lines must be non-conductive.
  3. Do at least one of the following:
    - i) Dedicate a Spotter with visual aids, clear sight, and dedicated communication with the operator.
    - ii) Set up and use an automated proximity alarm.
    - iii) Set up and use an automated range control warning device.
    - iv) Set up and use a device that limits the range of movement to avoid encroachment.
    - v) Set up an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.



- 
- vi) Posting of electrocution hazard warnings must be conspicuously posted in the cab of the crane so that it is in the view of the operator and at least two other such warnings on the exterior of the crane.

### **Power Line Safety (up to 350 kV) (1926.1408) – Operation**

1. Hazard assessment prior to beginning work.
  1. Identify the work zone by physically marking the limits of the crane operation. *(that is the area in which the crane will operate at ground level)* If not physically marked, the work zone is defined as 360° around the crane at the maximum working radius.
  2. Determine if any part of the crane, load line, or load, if operated at the crane's maximum working radius, could get closer than 20 feet to a power line. If so, it must meet the requirements of one of three options.
    - i) Option 1 – De-energize and ground the power line. Must be confirmed to be de-energized and visibly grounded at the site.
    - ii) Option 2 – Maintain 20 feet clearance by implementing measures specified in (b) below.
    - iii) Option 3 – Conform to Table A (at the end of this section) Clearances and implement the measure specified in (b) below.
2. Positive prevention of encroachment/electrocution is required with the use of options 2 or 3 and include all of the following:
  1. A pre-planning meeting is to be conducted with all workers involved with the operation to take place.
  2. Tag lines must be non-conductive.
  3. Erect and maintain an elevated warning line in view of the operator at the limit allowed by Option 2 or 3 and dedicate a spotter if the operator cannot reasonably see the warning line.
  4. Do at least one of the following:



- 
- i) Set up and use an automated proximity alarm.
  - ii) Dedicate a Spotter with visual aids, clear sight, and dedicated communication with the operator.
  - iii) Set up and use an automated range control warning device.
  - iv) Set up and use a device that limits the range of movement to avoid encroachment.
  - v) Install an insulating link/device as accepted by 29 CFR 1910.7 between end of load line and the load.
3. Voltage information is to be obligated to be provided by utility within two working days of request.
  4. No work can be performed under a power line unless the line is confirmed to be de-energized and is visibly rounded on site, or no part of the crane can get closer than 20 feet from the bottom of the power line.
  5. All power lines must be assumed to be energized unless confirmed otherwise by utility, and it is visibly grounded on site.
  6. When working near transmitter/communication towers, transmitters have to be de-energized, equipment grounded, and tag lines have to be non-conductive.
    1. Training must be provided to each operator and crew member in accordance with 1408(g)(1).
    2. Dedicated Spotters for their specific duties as well as above.
    3. All training is to be documented and maintained.

**Table A**

*Minimum Clearance Distances*

<b>Voltage</b>	<b>Minimum clearance distance</b>
<b>(nominal, kV, alternating current)</b>	<b>(feet)</b>
Up to 50	10



Over 50 to 200	15
Over 200 to 350	20
Over 350 to 500	25
Over 500 to 750	35
Over 750 to 1,000	45
Over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)

*Note:* The value that follows “to” is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

***Power Line Safety (over 350 kV) (1926.1409)***

In addition to 1926.1407 and 1926.1408, for power lines below 1000kV, the minimum distance is 50’ instead of 20’, and the minimum distance for power lines over 1000kV has to be established by the utility owner or qualified Registered Electrical Engineer (PE).

***Power Line Safety (all voltages) (1926.1410) – Equipment operations closer than the Zone***

All of the following conditions have to be met in order to operate closer than the distances set by Table A above:

1. Employer determines that it is infeasible to do the work without breaching the minimum distances.
2. After consulting with the utility, the employer determines it is infeasible to de-energize and ground the powerline.
3. The utility owner or Professional Electrical Engineer (PE) determines the exact minimum distances for the exact location, conditions, and operation (1926.1410(c)(1)).



- 
4. A planning meeting is required with the utility owner and engineer to determine all procedures to be followed to protect from electrocution for the particular lift. (Minimum procedures to be included are contained in (1926.1410(d) (1-12))
  5. All procedures are documented and available on-site.
  6. The equipment user and utility owner or engineer have to meet with the crane operator and the crew performing the work to review the written procedures.
  7. All procedures have to be implemented.
  8. One person shall be designated as in charge of the implementation of the written procedures and must have the immediate authority to stop work.
  9. The employer must train each operator and crew member assigned to work with the crane in accordance with (1926.1408(g)).



***Power Line Safety (1926.1411) – While traveling under or near power lines with no load***

1. When traveling with no load on the hook, the boom has to be sufficiently lowered to maintain the distances provided in Table T of this paragraph.

**Table T**

*Minimum Clearance Distances While Traveling with a Load*

<b>Voltage</b>	<b>While traveling-minimum clearance distance</b>
<b>(nominal, kV, alternating current)</b>	<b>(feet)</b>
Up to 0.75	4
Over .75 to 50	6
Over 50 to 345	10
Over 345 to 750	16
Over 750 to 1,000	20
Over 1,000	(As established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)

2. Effects of speed and terrain should be considered, including bouncing of the machine while traveling under the power lines.
3. A dedicated spotter will be used in continuous contact with the operator if the crane gets closer than 20 feet of the power line.
4. The power line shall be illuminated if traveling under the line at night.
5. Safe travel path shall be delineated.



---

***Inspections (1926.1412)***

1. Modified Equipment – Equipment modifications and additions affecting the safe operation or capacity of the crane shall be inspected by a qualified person after the modifications/additions are complete and prior to use.
2. Repaired/adjusted Equipment – Equipment that has had a repair or adjustment that relates to safe operation must be inspected by a qualified person prior to initial use. The inspection must include functional testing of the affected parts or components.
3. Post Assembly – Upon completion of assembly, the equipment must be inspected by a qualified person to ensure proper assembly prior to use.
4. Each Shift – Competent person must begin a visual inspection prior to each shift and complete the inspection before or during that shift. Shift or daily inspections shall include:
  1. Control Mechanisms for maladjustment.
  2. Control and drive mechanisms for excessive wear and contamination of lubricants.
  3. Pressurized lines for deterioration or leakage
  4. Hydraulic system fluid level
  5. Hooks and latches from damage
  6. Wire rope reaving
  7. Wire rope in accordance with 1926.1413(a)
  8. Electrical for malfunctions
  9. Tires for proper inflation and condition
  10. Ground conditions.
  11. Equipment level
  12. Windows for cracks and clarity
  13. Safety Devices



- 
5. Monthly – Monthly inspections will be made by a competent person of the same items in the daily/shift inspections and the inspection shall be documented showing the items checked and what was found with the inspector’s signature and date. Reports are to be retained for a minimum of three months.
  6. Annual/Comprehensive – At least once every 12 months, the equipment shall be inspected by a qualified person on the same items of the daily/shift inspection along with the items of 1926.1412(f)(2) (i – xxi).
    1. The annual inspection must include functional testing 1926.1412(f)(2).
    2. Deficiencies shall be noted as a safety hazard or items to be monitored on monthly inspections.
    3. Safety hazard deficiencies shall require the crane to be taken out of service until corrected.
    4. Monthly inspections on the deficiencies not classified as safety hazards are required by the employer (by competent person).
    5. Annual inspections are to be documented and maintained for at least 12 months.
  7. Severe Service – Where the crane has been exposed to severe conditions or loadings in excess of normal rated loads or shock, the suspected crane will be removed from service and inspected by a qualified person to check for structural damage or other related issues that would be suspect due to the circumstances.
  8. Equipment not in regular use – Cranes idle for more than 3 months shall be inspected by a qualified person in accordance with monthly inspection criteria.
  9. If any part of a manufacturer’s procedures regarding inspections that relate to safe operation that is more comprehensive or has a more frequent schedule of inspection than the requirements of this section must be followed.
  10. All documents produced by these inspections must be available during the applicable retention period for all inspecting persons.





---

### ***Wire Rope – Inspection (1926.1413)***

1. Shift Inspection – A competent person must begin a visual inspection prior to each shift which must be completed before or during that shift. This inspection is of both running and standing wire ropes on the equipment (crane/s). Apparent deficiencies, including birdcaging, broken or damaged wires, distortion of section, reduction of section >5%, and damaged end connections, are to be identified and addressed. Deficient wire rope is to be removed from service or tagged-out of service.
2. Monthly Inspection – Must be completed in accordance with Shift Inspection guidelines by a competent person. This inspection must be documented in accordance with 1926.1413(e)(3).
3. Annual/comprehensive Inspection – Must be performed every 12 months by a qualified person of the same items of the shift inspection. All cable must be run out for inspection of all wire rope surfaces. If crane cannot be boomed down, the inspection can be delayed up to 6 months but not longer than that period.

### ***Wire Rope – Selection and installation criteria (1926.1414)***

1. Rotation-resistant ropes are not allowed to be used for boom hoist reeving, with only specific exceptions.
2. All wire rope should have a design factor of not less than 5 with only specific exceptions.
3. Drums should have a minimum pitch of 18 times the nominal rope diameter.
4. Wire rope clips used in conjunction with wedge sockets must be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for dead-ending rope in a wedge socket is permitted.

### ***Safety Devices (1926.1415)***

The following safety devices are required on all cranes and must not be operated without them (alternative measures are not allowed):

1. Crane level indicator – except in marine applications
  1. Boom stops



- 
2. Jib stops
  3. Cranes with pedal brakes must have locks
  4. Outrigger jacks must have integral holding/check valves
  5. Cranes must have a working horn

### ***Operational Aids (1926.1416)***

The following operational devices are required on all cranes and in working order, except where an operational aid is being repaired, the employer uses the specified temporary alternative measures:

If a listed operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly.

#### **1. Category I – operational aids and alternative measures:**

1. Boom hoist limiting device required on machine made after Dec 16, 1969. Machines prior to Dec 16, 1969, without limiting device have to use alternative measures below.
  - i) Boom angle indicator.
  - ii) Clearly mark the boom hoist cable at a point that the operator can stop in time and install mirrors or cameras to see the boom hoist cable.
  - iii) Clearly mark the boom hoist cable and use a spotter to alert the operator.
2. Luffing jib limiting device
  - iv) Alternative measures same as for boom hoist
3. Anti-two-blocking device
  - v) All telescopic boom cranes manufactured after February 28, 1992, must be equipped with an anti-two-block device.



---

Alternative measures are to clearly mark the cable at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking and use a spotter when extending the boom.

- vi) Lattice Boom cranes manufactured after February 28, 1992, must be equipped with an anti-two-block device that automatically prevents damage from two-blocking, except that cranes made between February 1992 and November 2011 can operate with a device that warns the operator in time to stop and avoid two-blocking.

Anti-two block is not required on lattice booms used for dragline, clamshell, magnet, drop ball, container handling, concrete bucket, pile driving, and marine operations that do not involve hoisting personnel.

Alternative measures are to mark the cable at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking or use a spotter.

- 4. Articulating cranes made after Dec 31, 1991, with load hoists must have anti-two-block device. An alternative measure is to mark the cable to give sufficient time to stop and avoid two-blocking and use a spotter when extending the boom.
- 5. All Category I operational aids not working properly must be repaired within 7 calendar days, except if the part is ordered within the 7 calendar days, the repair must be complete within 7 calendar days of receipt of the parts.

**2. Category II operational aids and alternative measures:**

- 1. Boom angle or radius indicator must be installed and readable from the operator's station. Temporary alternative measures include measuring the boom angle or radius.
- 2. Jib angle indicator of a luffing jib. Temporary alternative measures are to ascertain the main boom angle and then measure the radius or jib angle.



- 
3. Boom length indicator on a telescopic boom where capacity is independent of the boom length. Temporary alternative measures are to include at least one of the following: mark the boom, calculate length from angle and radius, or measure the boom.
  4. Load weighing or similar devices shall be used on all cranes (other than derricks and articulating cranes) made after March 29, 2003, with a rated capacity over 6,000 LB. Temporary alternative measures are to determine the weight from recognized industry sources, such as the manufacturer, or to calculate the weight by known elements.
  5. Outrigger position sensors/monitors are required on such equipment, and hoist drum rotation indicators where the hoist drum is not visible to the operator on cranes manufactured after November 2011.
  6. All Category II operational aids not working properly must be repaired within 30 calendar days, except if the part is ordered within the 7 calendar days. The repair must be complete within 30 calendar days of receipt of the parts.

***Operation (1926.1417)***

1. The employer must comply with all manufacturer procedures applicable to the operations functions of the equipment, including the attachments.
2. Written procedures, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be readily available in the cab at all times for use by the operator.
3. Where load charts are electronic, and the electronics (computer) fail, the crane has to be safely shut down and tagged out of service.
4. The operator must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when used for signal communications).
5. Operator must not leave the controls while the load is suspended, except where all of the following are met (this does not include small working gear such as



---

ladders, slings, welders, etc., and that gear is not located over an entrance or exit):

1. The operator remains adjacent to equipment and not engaged in other duties.
2. The load is to be held suspended longer than normal period of lifting operations.
3. Competent person determines that it is safe to do so and takes additional precautions.
4. Barricades are erected to keep persons out of the fall zone.
6. The tag-out system (visible in the cab of the crane) has to be employed whenever the crane is taken out of service and the tagout has to be conspicuous in location. The tagout can only be removed by the authorized individual or until the operator has verified that no one is working on the machine in a dangerous position and that the equipment has been satisfactorily repaired.
7. Before starting the engine, the operator must verify that all controls are in the proper starting position and that all personnel are in the clear.
8. When a storm warning is issued, the competent person shall make determinations for operation or securing of machine.
9. If equipment requires adjustments or repairs, the operator must notify the service representative in writing and make sure other operators know that it needs fixing.
10. Safety devices and operational aids must not be used as a substitute for professional judgment by the operator.
11. If a competent person determines that there is slack in a rope, it must be verified prior to use and re-spooled if necessary.
12. The competent person must adjust the equipment and/or operations to address the effect of wind, ice, and snow on equipment stability and rate capacity.
13. Equipment must not be operated in excess of its rated capacity, and the operator must not be directed to do so. The operator must verify that the load is within the



---

rated capacity of the crane by calculation, reliable source or by load weighing device at a radius that will allow them to do so under 75% of chart.

14. Boom or other parts of the equipment must not contact any obstruction.
15. The equipment must not be used to drag or pull loads sideways.
16. No loads may be lifted over the front area of a wheel-mounted crane unless the manufacturer allows it.
17. Operators must test brakes any time a load is more than 90% of maximum line pull.
18. At least two full wraps of rope are to be on the drums at all times.
19. A competent person shall be in charge of the operation when traveling with a load if allowed by the manufacturer.
20. The rotational speed of the crane is to be controlled so that no load swings out of rated capacity.
21. Tag or restraint line must be used to prevent rotation of the load.
22. Brakes must be adjusted in accordance with manufacturer specifications.
23. The operator must obey a stop or emergency stop signal regardless of who gives it.
  1. Equipment must not be operated without counterweight or more counterweight than specified.

### ***Authority to Stop Operations (1926.1418)***

Whenever there is a concern as to safety, the operator must have the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.

### ***Signals – General Requirements (1926.1419)***

1. A signal person must be used when:
  1. The load is not completely visible to the operator.
  2. The operator cannot see all obstacles when traveling the machine.



- 
3. The operator or the person handling the load determines it is necessary.
  2. Signals to operators must be by hand, voice, audible, or new signals (defined below)
  3. Hand signals must be the same signals shown in Appendix A except when otherwise agreed to in advance between the operator, signal person, and lift director.
  4. New signals consist of some other type of signal than the standard voice, hand, or audible signals and must be equally effective or comply with a national consensus standard that is equally effective.
  5. The signals used must be appropriate for the site conditions and could include video or radio in addition to traditional methods.
  6. The ability to transmit signals between the operator and signal person must be maintained at all times.
  7. Only one person may give signals to a crane at a time with the exception of an emergency stop signal.
  8. Every person on site is responsible for giving an emergency stop signal if they become aware of a safety problem.
  9. All directions must be given from the operator's perspective.
  10. Where directing multiple cranes, a clear system has to be in place to ensure the proper crane receives the proper signal. Primarily this is done by addressing the particular crane prior to making the signal.

***Signals – radio, telephone, or other electronic transmission of signals (1926.1420)***

1. The devices used to transmit the signals must be tested on-site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.
2. The signal transmission must be through a dedicated channel, except that other equipment essential to the lifting operation may also be on that dedicated channel only if they are essential to the lifting operation.
3. The operator's reception of the signals must be by a hands-free system.



---

***Signals – voice signals – additional requirements (1926.1421)***

1. Participants in the lift (operator, signal person, and lift director) must conduct a pre-lift meeting to discuss the voice signals and mutually understand the signals to be given.
2. Each voice signal must contain the following three elements in the order: function (such as hoist, boom, etc.), direction, distance and/or speed, function, and stop command.
3. The operator, signal person, and lift director must be able to effectively communicate in the language used.

***Signals – hand signal chart (1926.1422)***

Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.

***Fall Protection (1926.1423)***

Boom walkways (does not apply to Tower Cranes) – must be included on cranes with booms greater than 6 feet high manufactured after November 8, 2012.

1. Original access and fall prevention equipment must be maintained (steps, handholds, ladders, guardrails/grabrails)
2. Cranes manufactured after November 8, 2012, must be equipped so as to provide safe access and egress between the ground and the operator workstation. Walking and stepping surfaces, except for crawler treads, must have slip-resistant features/properties.
3. Tower Cranes manufactured after November 8, 2012, must provide safe access and egress between the ground and the cab, platforms, and mast by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails.
4. Standard personal fall arrest and fall restraint systems are to be used but can be attached to other supports and substantial members that would provide a 5,000 LB per person anchorage.





- 
5. For non-assembly/disassembly work, fall protection equipment must be used when over 6 feet above a lower level on a crane while moving point to point or when crane is at its work location.
  6. For assembly/disassembly work, fall protection equipment must be used when over 15 feet above a lower level except near draw-works, in the cab, or on the deck.
  7. Anchorage points have to support 5,000 LB but can be dual purpose as a structural component of the machine. The competent person should make the call as to what is adequate and what is not. If he/she has any question whether it is, then other anchorage should be used, or Engineer contacted.
  8. Anchorage for fall restraint has to have a 2:1 factor of safety to the loads an employee could impose.
  9. Tower cranes have to provide fall protection when exposed to falls greater than 6 feet while working and 15 feet when erecting, climbing, or dismantling.
  10. A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) only when the qualified person has determined that the set-up and capacity are sufficient to provide support of 5,000 LB/person, the crane operator knows this is being used as such, and no other load is attached to the block or load line.

Training must be given to each person who may be exposed to fall hazards while on or hoisted by equipment covered by this subpart.

***Work area control (1926.1424)***

This applies where there are accessible areas in which the equipment's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of striking or pinching/crushing an employee.

1. To prevent employees from entering these hazard areas, the employer must:
  1. Train each person in the hazards of working near the crane or cranes.
  2. Erect and maintain control lines, warning lines, railings, or similar barriers to mark the boundaries of the hazard areas. If it is proven that this is not



---

feasible to do this, the hazard areas must be clearly marked by a combination of warning signs and high-visibility markings on the crane, and each employee must be trained as to what these markings represent.

3. Special precautions are to be taken when an employee enters the hazard area out of the view of the operator by ensuring that the operator knows the person will enter the area and that the operator does not swing the superstructure until they are notified that the employee is out of the hazard area.
2. Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations so that the two or more machines do not create a pinch/crush hazard.

***Keeping clear of the load (1926.1425)***

1. Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used, to the extent consistent with public safety.
2. While the operator is not moving a suspended load, no employee must be within the fall zone, except for riggers or persons operating a concrete hopper (bucket).
3. When rigging the load or initial connection to a structure or component within the fall zone of the rigger, the following must be met:
  1. Materials must be rigged to prevent unintentional displacement.
  2. Hooks must use self-closing latches or equivalent.
  3. Materials must be rigged by a qualified rigger.
4. Only employees needed to receive a load are permitted in the fall zone when the load is being landed.
5. Tilt up construction does not allow any employee to be under the load, and only essential employees within the fall zone of the load.

***Free fall and controlled load lowering (1926.1426)***

1. Free fall type booms (live booms) cannot be used in any of the following circumstances:



- 
1. An employee is in the fall zone of the boom or load.
  2. An employee is being hoisted.
  3. The load or boom is directly over a power line or could fall within the area defined in Table A
  4. The load is over a shaft with employees in the shaft (OK when no one is in the shaft)
  5. The load is over a cofferdam and there are employees in the fall zone of the boom or load.
  6. Lifting in a refinery or tank farm
2. In addition to the above, the equipment has to be manufactured prior to October 31, 1984, or is a floating crane/derrick or a land crane/derrick on a vessel or floatation device.
  3. Where use of equipment with a boom that is designed to free fall (live boom) is prohibited, the boom hoist must have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:
    1. Friction drums must have both a friction clutch and braking device to allow for controlled lowering as well as a secondary braking or locking device to back up the primary brake.
    2. Hydraulic drums must have integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure.
    3. Neither clutches nor hydraulic motors must be considered brake or locking devices.
    4. Hydraulic boom cylinders must have an integrally mounted holding device.
  4. Hydraulic telescoping booms must have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.
  5. Controlled load lowering is required, and free fall of load line is prohibited when:



- 
1. An employee is directly under the load.
  2. An employee is being hoisted.
  3. The load is directly over a power line or can be within the area as defined by Table A at the radius of the crane.
  4. The load is over a shaft.
  5. The load is over a cofferdam and there are employees in the fall zone of the boom or load.

***Operator qualification and certification (1926.1427)***

As of November 4th, 2014, the employer must ensure that, prior to operating any equipment covered under subpart CC, the person is operating the equipment during a training period in accordance with paragraph (f) of this section, or the operator is qualified or certified to operate the equipment in accordance with paragraph (b) which is “Option (1) Certification by an accredited crane operator testing organization”.

1. Operators are not required to be certified to operate derricks, side boom cranes, or hoisting equipment rated at 2,000 pounds or less.
2. The employer must provide the qualification or certification at no cost to the employee.
3. Paragraph (b) – (Preferred by Austin) Certification by an accredited crane operator testing organization, specifies that the operator is to be certified only after passing both a written and practical exam administered by an accredited organization based on the equipment capacity and type.
4. An operator will be deemed qualified to operate a particular piece of equipment if the operator is certified under paragraph (b) for that type and capacity of equipment or for higher capacity equipment of that type.
  1. If no accredited testing agency offers certification for a particular type and/or capacity of equipment, an operator will be deemed qualified to operate that equipment if the operator has been certified for the type /capacity that is most similar to that equipment for which certification is available.



- 
2. The operator's certificate must state the type/capacity of equipment for which the operator is certified.
  5. This type of certification is portable and follows the operator from job to job and employer to employer.
  6. Certification is valid for 5-year periods prior to retesting.
  7. Paragraph (e)-Licensing by a government entity allows for licensing by a governmental body only if it meets that same standard of paragraph (b). However, it is only valid while in that jurisdiction and no longer than 5 years without recertification.
  8. Paragraph (f) addresses operation of equipment prior to certification and after November 4<sup>th</sup>, 2014. Essentially, all operators that do not have certification prior to that date are to be considered only as "Operators-in-Training" and must be continually monitored by the Trainer, who is himself a certified operator.
    1. The operator-in-training may not, in any circumstance, operate the crane near power lines or as a critical lift.
  9. Paragraph (h) allows for testing and certification of operators in languages other than English. However, if they are certified in another language, that language is the only language to be used in the operation of that machine with that operator.

***Signal person qualifications (1926.1428)***

Unless certified with documentation by a third-party qualified evaluator, each signal person has to meet the qualifications of paragraph (c) and maintain documentation of meeting the criteria on the job site that the person is currently working on.

1. This documentation must specify each type of signaling (e.g., hand signals, radio signals, etc.) for each person.
2. Paragraph (c) Qualification Requirements include, and each qualified signal person must know:
  1. Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals.



- 
2. Be competent in the application of the type of signals used.
  3. Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.
  4. Know and understand the relevant requirements of 1926.1419 through 1926.1422 and 1926.1428.
  5. Demonstrate that he/she meets the requirements in paragraphs (c)(1) through (4) of this section through an oral or written test, and through a practical test.

This means that each Qualified Signal person should have documentation of training, written testing (following the training), and a proficiency exam to be administered in the field prior to signaling.

***Qualifications of maintenance and repair employees (1926.1429)***

Maintenance, inspection, and repair personnel are only allowed to operate the equipment where:

1. The operation is limited to those functions necessary to perform the maintenance, inspection, or verification of performance.
2. The personnel must be familiar with the operation limitations, characteristics, and hazards associated with the equipment or must do so under the direction of a certified operator.

Maintenance and repair personnel must meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed.

***Training (1926.1430)***

The employer must provide training as follows:

1. **Overhead Powerlines** – The employer must train each employee involved.
2. **Signal persons** – The employer must train each employee that will provide crane signals under 1926.1428



- 
3. **Operators** – The employer is responsible for training each operator leading to their certification prior to November 2014.
  4. **Competent persons and qualified persons** – The employer must train each competent and/or qualified person regarding the requirements of this subpart applicable to their respective roles.
  5. **Crush/pinch points** – The employer must train each person who works with the equipment to keep clear of holes and crush/pinch points.
  6. **Tag-out** – The employer must train each operator and each additional employee authorized to start/energize equipment or operate equipment controls in proper lock-out/tag-out and start-up procedures.

All training has to evaluate the employee to confirm that the person understands the information. Refresher training must be provided as necessary based on the person's continued performance (if they lose proficiency, they must be retrained). All training is to be provided at the expense of the company and not the employee.

### ***Hoisting Personnel (1926.1431)***

The use of equipment to hoist employees is prohibited except where the employer demonstrates that the erection, use, and dismantling of conventional means of reaching the work area, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions. (This does not include subpart R Steel Erection)

If it is demonstrated that other means are more hazardous or it is not possible, each of the onerous requirements of 1926.1431 (b) through (n) are to be strictly adhered to. Included in these paragraphs are requirements for the equipment design and construction, derating of the

1. Cranes are not to exceed 50% of chart, the use of anti-two block devices on the cranes, controlled load lowering, trial lifts and inspections prior to each use at each location and set-up, monitoring weather conditions, fall protection, meetings and restrictions on work near power lines.



- 
2. Further allowances are made for the use of personnel platforms and/or boatswain's chairs for access in larger drilled shafts, pile driving, marine transfer and storage tanks, and shaft and chimney operations.

***Multiple-crane/derrick lifts – supplemental requirements (1926.1432)***

Requires preplanning of multiple crane lifts and must include the following:

1. Must be developed by a qualified person (Lift Director)
2. Must be designed to meet all parts of this subpart.
3. Where the qualified person determines that engineering expertise is needed for the planning, the employer must ensure that it is provided.

The multiple crane lift must be directed by a competent and qualified person (Lift Director), and the plan must be reviewed in a meeting with all workers who will be involved with the operation by the Lift Director.

***Design, construction, and testing (1926.1433)***

1926.1433 outlines the design, construction, and testing criteria for all equipment with a manufacturer's rated hoisting/lifting capacity of more than 2,000 pounds. This is primarily linked back to the ANSI B30.5 and AMSE B30.5 specifications/regulations.

It also requires the posting of adequate lift charts for the particular machine, including recommended reeving for the hoist lines, recommended parts of hoist reeving, size and type of wire rope for various equipment loads, tire pressures, cautions, the position of gantry, instructions for boom erection, procedures, sequences, etc. (1926.1433(d))

1926.1433(d) also requires; load blocks to be heavy enough to overhaul the line from the highest hook position, hook and ball assemblies and blocks to be marked with their rated capacity and weight, hooks to have working latches unless it is proven to be safer and the route of the loads are preplanned to avoid personnel, warning labels, fire extinguisher and other cab requirements.

***Equipment Modifications (1926.1434)***

Modifications or additions which affect the capacity or safe operation of the equipment are prohibited except where the Manufacturer reviews and approves of the modification





---

in writing. If the manufacturer refuses to review the request, a Professional Engineer qualified in crane engineering may review for approval.

***Tower Cranes (1926.1435)***

1. Manufacturer assembly/disassembly procedures are to be followed.
2. No personnel are allowed under the tower crane jib or counterweight during erection.
3. Foundations have to be designed by either the manufacturer or a professional engineer.
4. Multiple tower crane job sites require positioning such that one crane will not conflict with another.
5. 1926.1415 does not apply to tower cranes, but other safety devices are required instead.
6. 1926.1416 does not apply to tower cranes and alternative measures are not permitted to be used.
7. Multiple inspections are required prior to erection, during erection, after erection, and during operation.

***Derricks (1926.1436)***

Contains supplemental requirements for the use of derricks. A derrick is powered equipment consisting of a mast or equivalent member that is held at or near the end by guys or braces, with or without a boom, and its hoisting mechanism. The mast/equivalent member and/or the load is moved by the hoisting mechanism (typically base-mounted) and operating ropes.

Derricks include A-frames, baskets, breasts, Chicago booms, gin poles (except gin poles used for the erection of communication towers), guys, shear legs, stiff legs, and variations of such equipment.

***Floating cranes/derricks and land cranes/derricks on barges (1926.1437)***

1. Does not apply on jacking barges when jacked out of water.
2. The employer must either:



1. Erect and maintain control lines, warning lines, or similar barriers to mark the boundaries of the hazard areas or
2. Clearly mark the areas with signs and train persons on the hazards
3. Keeping clear of load 1926.1425 does not apply.
4. Additional safety devices required include list and trim for barge, positive house swing lock, and wind speed and direction indicator located where the crane operator can see them at all times.
5. Anti-two block only required while hoisting personnel.
6. Must inspect the barge each shift and month by a competent person.
7. Annual inspection is required by a qualified person.
8. A 4-year inspection is required by a marine engineer/architect/surveyor or other qualified person.
9. Must keep all inspection reports for four years.
10. Cannot exceed 5 degrees list or trim and must keep entire underside of barge submerged.
11. Cranes must be restrained from unwanted movement except for auxiliary cranes.

***Overhead and Gantry Cranes (1926.1438)***

Permanently installed overhead and gantry cranes are not covered by this subpart but by the requirements of 1910.179, except for 1910.179(b)(1).

Overhead and gantry cranes not permanently installed in a facility include such equipment as Overhead and gantry cranes, overhead/bridge cranes, semi-gantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment having the same fundamental characteristics, irrespective of whether it travels on tracks, wheels, or other means.

Most of the content of Subpart CC is applicable. However, there are several paragraphs that do not apply, and further reference is made to ASME B30.2-2005 and other regulations that should be researched in full when anticipating the use of this type of equipment.



---

### ***Dedicated Pile Drivers (1926.1439)***

Where a crane is designated as a dedicated pile driver, while it is in that designation and used solely for pile driving, it does not have to have anti-two blocking devices or load weighing devices (unless it was manufactured after November 8, 2011).

### ***Side boom Cranes (1926.1440)***

Subpart CC applies to side boom cranes except 1926.1402 (Ground conditions), 1926.1415 (Safety devices), § 1926.1416 (Operational aids), and 1926.1427 (Operator qualification and certification). Other isolated exceptions and additions are made in this section with regard to the use of Side boom cranes. This also incorporates ASME B30.14-2004 by reference.

### ***Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less (1926.1441)***

Most of the other paragraphs of this subpart are applicable to this size of equipment, with the distinct exception of the requirement for certification as a crane operator. In addition, rigging of the load does not require qualified riggers.

Inspections are applicable to this and other procedures. Equipment in compliance with manufacturer's specifications

1. Safety devices and operation aids that are a part of the original equipment must be maintained at all times.
2. Anti-two blocking devices are required on equipment manufactured after November 8, 2011.
3. Employers must train each operator and signal person prior to their use of the equipment.
4. These hoists cannot be used to hoist personnel.

### **Appendix A to Subpart CC of Part 1926 – Standard Hand Signals**

### **Appendix B to Subpart CC of Part 1926 – Assembly/Disassembly: Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement**

### **Appendix C to Subpart CC of Part 1926 – Operator Certification: Written Examination: Technical Knowledge Criteria**